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**Appendix A (Pages 80-95)
Appendix B (Pages 97-104)
Appendix D (Pages 113-140)**

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School of Education

**PREDOMINANT NURSING STUDENTS' LEARNING PROFILE AND
NURSING FACULTY TEACHING STYLES AS RELATED TO
FINAL COURSE GRADE IN A BACCALAUREATE
NURSING PROGRAM IN PUERTO RICO**

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Lourdes Mendez Cruz

July 2002

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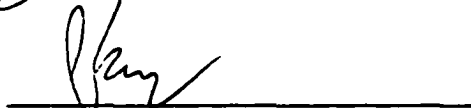
**A dissertation
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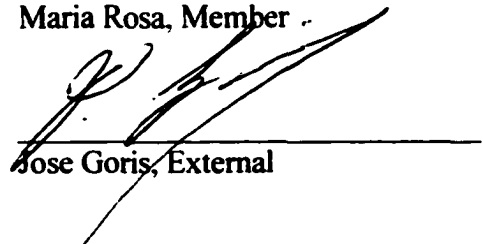
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ABSTRACT

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Chair: Judy Anderson

ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

School of Education

**Title: PREDOMINANT NURSING STUDENTS' LEARNING PROFILE AND
NURSING FACULTY TEACHING STYLE AS RELATED TO FINAL
COURSE GRADE IN A BACCALAUREATE NURSING PROGRAM IN
PUERTO RICO**

Name of researcher: Lourdes Méndez Cruz

Name and degree of faculty chair: Judy Anderson, Ph.D.

Date completed: July 2002

Problem

The purpose of this study was to investigate the relationship between students' predominant learning profile, faculty teaching preferences, and the final course grade in a 4-year nursing program at a private Christian university in Puerto Rico.

Method

A non-experimental descriptive research design was used for this study. The Learning Profile Indicator was administered to all nursing students ($n=138$) while the Teaching Style Inventory was given to all faculty ($n=9$). Demographic sheets were also given to both students and faculty. Students' final course grades were obtained from the faculty. Descriptive (frequency, means and standard deviations) and inferential statistics

(Chi-square test of association, and two-way analysis of variance) were used to analyze the data.

Results

In this study, most students (53.6%) had the Sensing-Thinking learning style. On the other hand, most faculty preferred the Sensing-Feeling (44.4%) and Intuitive-Thinking (33.3%) teaching style. Chi-Square test of association resulted in no statistically significant relationship between learning style and year in the nursing program ($\chi^2 = 5.68$, $df = 6$, $p = 0.46$). Similarly, no significant relationship between learning style and teaching preferences was indicated ($\chi^2 = 4.49$, $df = 4$, $p = 0.34$). Students with Intuitive-Feeling learning style ($m = 71.75$, $sd = 10.40$) scored significantly lower than students with Sensing-Thinking ($m = 83.97$, $sd = 9.28$), Sensing-Feeling ($m = 83.73$, $sd = 8.58$) or Intuitive-Thinking ($m = 87.87$, $sd = 6.84$) learning styles. Students taught by the one faculty member who had an Intuitive-Feeling teaching preference scored significantly higher ($m = 93.5$, $sd = 3.79$) than students taught by faculty with other teaching preferences. There was no interaction between learning style and teaching preferences.

Conclusion

The match between faculty teaching preferences and student learning styles is quite low (about 20%). Learning styles is not related to year in nursing program or faculty teaching preferences. However, final course grade is related to learning styles and teaching preferences.

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ACKNOWLEDGMENTS

The immediate goal is over but some more important things last forever. It is time to recognize the group of persons that have made possible this happy ending.

First of all, I gratefully acknowledge Dr. Judy Anderson and Dr. Jimmy Kijai, for their availability, cooperation, and interest in this work. Special mention of Dr. Maria Rosa has to be made for her valuable encouragement and dedication during this investigation.

I want to acknowledge the friendly support and cooperation of my AAU coworkers: Esperanza Tejada, Jackie Agesilas, Zilma Santiago, Obed Jimenez, Edwin Alicea, and Prof. Cecilio Urena. Special thanks to Carmen Cortes for her support and genuine interest in the success of this project. I want to thank Dr. Edwin Hernandez for being the person who motivated me and believed that I could reach this goal.

I also want to express my gratitude to my family, Mom, Dad, and Evy, and my aunts for their support and prayers. Last, but not least, thanks to my husband for being the computer expert, a great inspiration, a strong support, and a partner in prayer. Finally, the power and strength needed in the good and hard times came from on High, from God, to whom may be the Glory.

CHAPTER I

INTRODUCTION AND BACKGROUND

In recent years, the topic of learning styles has been generating more interest among educators. Doing, watching, thinking and feeling have each been considered to be ways of learning (Highfield, 1988). Every person chooses and develops a unique combination of these activities as a learning style. Success in school will be affected by the student's predominant learning style. Duncan (1996) maintains that the ease with which one learns depends on two factors: the congruency of the student's learning style with the teacher's teaching style, and the student's ability to adapt to a mismatched teaching style.

Nursing faculties, as with any other group of professors, will always be confronted by various students possessing a variety of learning styles. To help these students, faculty must implement teaching/learning strategies that will reach all students regardless of their learning styles. What happens, however, when the teacher's preferred teaching style is not compatible with the learning profile of a student?

Research on teaching style indicates that the things teachers do in the classroom make a difference in how their students learn (Hayes, 1989). Today's teachers are confronted with a diversity of student needs and varied levels of potential and are expected to teach all types of students equally well. Teachers frequently believe that their own learning style is the easiest one, or the better way to bring knowledge to all students

(Dunn & Dunn, 1979). There is much discussion about whether it is more effective to match or mismatch learning style with teaching style. Smith and Renzulli (1984) suggest that one matching approach which directly relates to our work as teachers involves having students examine their own needs and goals, and then providing teaching styles based on their stated preferences.

Robotham (1999) states that in the initial stages of a learning program, matching instructional formats to learners' learning styles would be appropriate, while individuals seek to overcome initial unfamiliarity with the new material being presented. If it is possible to identify the predominant learning style, doing so would allow the teacher to make decisions about whether to match or mismatch the instructional approach used to that particular learning style. If the nursing student's predominant learning profile across the 4 years of study in a BSN nursing program is clearly identified and understood, then nursing teachers will have the opportunity to respond to a more diverse student body, communicate the subject matter in a more effective way thereby increasing the student's retention, feel more rewarded for the innovations that they implement in their work, and ensure the future of their discipline.

According to the annual survey by the American Association of Colleges of Nursing (AACN) in 2000, RN to Baccalaureate enrollments show strong declines in every region of the nation. This new nursing shortage has caused nursing program accrediting agencies to take part in an action plan for the restructuring of the health care system in order to enhance the nursing workforce. Some of the suggested recommendations were to retain and encourage nursing students coming from diverse

backgrounds; update curriculum; and implement teaching strategies suitable to the requirements and needs of the students. In addition, research reveals that the highest percentage of nursing student course failures occur in the first year of the nursing major (Hudepohl & Reed, 1984). Skodol and Levy (1978) argue that some studies concluded that the more extroverted, adventurous individual tends to leave nursing education for other fields; while others have concluded that the nursing school dropout is less emotionally mature than her persevering counterpart (p. 437). The recommendations made by Skodol and Levy in their article, point out that sound personal and career counseling before and during nursing program attendance allows a student the opportunity to consider his expectations of the program (p. 441). As a result, in this study I was very interested in identifying the predominant learning profile of baccalaureate nursing program students at Antillean Adventist University (AAU), a nursing program on the island of Puerto Rico, and determine their relationship to the nursing faculty's preferred teaching styles. Moreover, I obtained the final course grades of the students and made a comparison with the results obtained from the Teaching Style Inventory (2001-2002).

This research took place in the western part of the island of Puerto Rico. The island currently has about 54 public and private institutions of higher education that offer nursing programs, 18 of which offer baccalaureate degrees ("Datos Estadísticos De Facultad de las Instituciones de Educacion Superior en Puerto Rico, Años Academicos 1997-98 y 1998-99," 2001). Antillean Adventist University is a private institution that serves the community in the western part of Puerto Rico. One of the principal academic

programs of this university is the Baccalaureate Nursing Program (BSN), with an option to finish an Associate Nursing Degree in 3 years. The collected statistical data demonstrate that the baccalaureate nursing student population who belong to this program consists of 138 individuals. The nursing faculty who teach in this nursing program consists of 9 individuals.

The knowledge base that supports this research is composed primarily of the Psychological Type Theory by Carl G. Jung (1923), the Learning Style research conducted by Bernice McCarthy (1987), and the work of Hanson (1997) and Silver, Hanson, and Strong (1980). These authors have contributed to learning style theory by interpreting the human personality and developing instruments to identify the ways in which people learn.

Rationale

In a review of the education literature, numerous articles can be found about how to identify learning profiles and how to apply this information. In nursing education literature, however, very few articles addressed learning styles in relation to a nursing education program. Even fewer references can be found related to nursing education in Puerto Rico. Although some nursing programs show a trend of increasing enrollment, currently there exists a shortage of nurses, and the problem is expected to continue into the next decade. A federal advisory panel has recommended that to meet the demands of today's health care environment, at least two-thirds of the nurses in the workforce need to

hold a baccalaureate degree or higher. This recommendation makes it imperative for BS nursing programs to plan ways to attract and retain students through the completion of their training (American Association of Colleges of Nursing, 2000). A thoughtful examination of learner needs would be an important part of that plan.

A major factor responsible for student success or failure is the effectiveness of the teaching-learning process. The idea that people learn in different ways is not a new idea in education. Jung (1923) and others since (McCarthy, 1987; Silver, Hanson, Shing, & Schwartz, 1995) describe these learning styles by observing how different people perceive, judge, process, and approach new information (Garity, 1985; Shields, 1995; Wells & Higgs, 1990). From their studies, Dunn and Dunn (1979) stated that not only did people learn in different ways, but that “certain students achieve through selected methods that fail to produce academic results for others” (p. 238).

Teacher-student interactions are at the core of education and learning. Bevis and Watson (1989) define curriculum “as those transactions that take place between students and teachers and among students with the intent that learning takes place” (p. 72). There is a need to describe the predominant learning style of nursing students and to determine whether a difference in predominant learning style exists among the first-year, second-year, third-year, and fourth-year students; and if there is a difference, whether it does actually influence students' learning. Identifying predominant learning profiles and integrating them into nursing education programs may promote satisfying learning experiences, and at the same time result in formulation of criteria for academic excellence and increased productivity in the workplace (Partridge, 1983).

Teachers also have varied teaching styles (Beishline & Holmes, 1997; Cornett, 1983). Several authors state that teachers teach in the way they learn, and perhaps of even more impact on student learning is that teachers often believe that the learning style they prefer is the easiest, or right way, to master the knowledge (Barbe & Milone, 1980; Bargar & Hoover, 1984; Reckinger, 1979). Thus, students may be expected to adapt their learning profile to the teacher's style of instruction. This has the potential to hinder student success. First-year nursing students, particularly those who may already have several high-risk factors, could be placed at an even greater risk for failure and dropout with this additional stress (Hudepohl & Reed, 1984; Matthews, 1991).

Although some styles are more compatible with academic achievement than others (Miller, Always, & McKinley, 1987), there is no "right" learning style. What is important is an understanding of every student's right to learn. Teachers need to be able to prepare and present lessons in ways that assure learning opportunities for all students. Rakoczy and Money (1995) suggest that this can be accomplished by designing educational programs that provide the students with the opportunity to experience a variety of learning profiles.

By exploring the relationship between the predominant learning profiles of baccalaureate nursing students, the nursing faculty's preferred teaching style, and the final course grades the students obtained in each course taken across the four years of study in the AAU nursing program in Puerto Rico, I hope to extend the understanding of nursing education professionals about the impact of teaching preferences and learning profiles on student success and retention in 4-year-degree nursing programs.

Statement of the Problem

Research has shown that learning profiles affect a student's achievement or success in school. The ease with which one learns depends on the congruency of a student's learning profile and the teacher's teaching style. The National League for Nursing (2000) recommends a nursing program self-assessment that includes faculty preparation, curriculum updates, and the use of teaching strategies that are mindful of the needs of students and their graduate success rates in order to decrease the actual nursing shortage. Grades of first-year college or university students are of concern both to the students and to administrators, because grade point average is a factor in retention. Researchers indicate that persons with certain profiles of learning do better in school than individuals with other styles. To meet the more complex demands of today's health care environment, a federal advisory panel has recommended that at least two-thirds of the basic nurse workforce hold baccalaureate degrees in nursing by 2010. According to the U.S. Bureau of Labor Statistics (2001), employment for RN's will grow faster than the average for all occupations through 2008. Meanwhile, RN to Baccalaureate enrollments have recently experienced strong declines in every region of the nation. Consequently, this study is an attempt to investigate the relationship between the predominant learning profiles of baccalaureate nursing students, the nursing faculties' preferred teaching styles, and the students' final course grades in each class taken in the nursing program after each of the 4 years.

Purpose of the Study

The purpose of this investigation is to study the relationship between the predominant learning profiles of baccalaureate nursing students in a 4-year nursing program as related to their nursing faculty's preferred teaching style and the final course grade obtained. This assessment was conducted through the use of two self-report instruments: (1) the Teaching Style Inventory (TSI), and (2) The Learning Profile Indicator (LPI), as well as the final course grade reported for each student group across the 4 different years in the nursing program (see appendices A and B).

Research Questions

I wanted to examine the relationship between nursing faculty teaching styles, nursing student learning profiles, and the students' final course grades. The following are the research questions that were answered by this study:

1. What is the relationship between a student's learning profile and the number of years spent in the nursing program?
2. What is the relationship between the nursing faculty's preferred teaching style and the nursing students' learning profiles in the 4-year nursing program at AAU?
3. What is the relationship between nursing students' learning profiles, the preferred nursing faculty teaching style, and final course grades?

Research Hypotheses

The following hypotheses were tested in this study:

1. There is a learning profile that is related to the number of years spent in the

nursing program at AAU.

2. There is a significant relationship between the nursing faculty's preferred teaching style and the predominant learning profiles of each group of nursing students in the AAU nursing program.

3a. There is a significant relationship between student learning profiles and final course grade.

3b. There is a significant relationship between faculty teaching preferences and final course grade.

3c. There is a significant interaction between student learning profile and faculty teaching preferences.

Theoretical Framework

The goal of this study is to investigate the relationship among the predominant learning profiles of baccalaureate nursing students, the nursing faculty's preferred teaching style, and the final course grades received for each course taken in the program. The data obtained could contribute to the development of a more comprehensive curriculum and a more focused teaching-learning process in nursing education. The theoretical framework for this study is based on the Psychological Type Theory by Carl Jung (1923) and on the research work and assessment instruments for learning styles and teaching styles developed by J. Robert Hanson (1997) and H. Silver (Silver & Hanson, 1980).

The typology Jung (1923) developed to characterize typical differences consists of two attitudes, extroversion and introversion; two perception functions, intuition and sensing; and two judgment functions, thinking and feeling. The attitudes describe our stance in dealing with the things we encounter. Extroversion refers to those who are outgoing with regard to their interests, and how they think, feel, and act in relation to an object. Introversion refers to those who are more reserved. They think, feel, and act in a way that demonstrates that the subject is the prime motivating factor. For example, in a classroom some students will be more energetic, active, and easily involved in something most of the time (extroverts), while other students will appear quiet and reserved, often passing unnoticed (introverts) by others. Jungian theory also postulates two opposing functions used while the learner is perceiving information, *intuition and sensing*, and two functions used while the learner is making judgments, *feeling and thinking*. Intuitive people tend to perceive information holistically. They may appear to be imaginative, creative or theoretical in their interest. They may also be seen as impatient and imprecise, or careless with details. Sensing as a way of perceiving information describes those who tend to deal well with details and facts, preferring experiences to theory. They do not deal as well with complicated situations that require seeing the world of possibilities. Finally, incoming data are judged by two distinct modes: thinking and feeling. Thinkers tend to be logical, analytical, and impersonal. They also like to solve problems by dealing with causal relationships. Persons who judge through the feeling mode tend to rely on values, personal beliefs, subjective responses, and internal evidence. They tend to relate to others in a sympathetic, personal manner.

Since these three pairs of functions (introversion, extroversion; intuition, sensing; and thinking, feeling) are opposites, they cannot operate simultaneously. However, each individual possesses all six functions; it is the relative predominance of some over the others that determines type and affects behavior. There are several implications here for the educational setting. The sensing-thinking teacher's logical, detailed approach may be difficult to comprehend by a student who is a more holistically oriented, intuitive, feeling type; the approaches that each uses to perceive and make decisions will be different as will what each values and thinks is important to learn. Conflicts in type may also lead to problems in interpersonal communications between students and teachers. A student with a dominant-feeling type who has difficulty with analytic reasoning will not only avoid it but may speak negatively about its value, trying to discredit it. The dominant-thinking student may try to avoid human relationships or maintain them on a strictly logical basis. The teacher will have to develop the skill to work with both of these types of students and try to deliver instruction to meet their needs.

Student preferences for teaching styles or activities are also affected by their own dominant type. For example, sensing types like learning activities that involve direct experience, well-defined goals and expectations, and practical outcomes through well-organized instruction. Intuitive types like to deal with global concepts rather than facts, read or listen to acquire ideas, and learn in a more open instructional format. Thinking-type students prefer logically organized instruction, lectures, and objective tests; they tend to be more persistent in achieving goals. In contrast, feeling types tend to value approval, personal support, and a sense of belonging. The third component (introvert and

extrovert) acts as a modifier, that is, introverts like to work on their own, and extroverts prefer group activities and projects (Hanson & Hanson, 1999; Silver & Hanson, 1980).

Teachers' instructional choices are also affected by type. Sensing-type teachers emphasize specific skills, facts, and concrete outcomes. They focus students' attention on a controlled set of activities. Intuitive-type teachers tend to emphasize concepts more than facts, and overemphasize speculations about possible meaning and interrelations among concepts. Thinking-type teachers emphasize the logical structure of ideas and activities, and specifically focus on content and large group processes such as lectures. Feeling-type teachers prioritize individual assessment, individual instruction, and small group activities. Introverted teachers prefer to focus more on the ideas or content of instruction, and interact less with students individually. Extroverts prefer to employ a variety of activities with their students, because they naturally feel more attuned to the students' thinking styles (Hanson & Hanson, 1999; Silver & Hanson, 1980).

I designed a conceptualization diagram to show Carl Jung's theory in relation to the predominant student learning profile, the nursing faculty's preferred teaching styles, and final course grades (Figure 1). The three circles represent the three components related to this study (nursing students' learning profiles, nursing faculty's preferred teaching styles, and final course grades). Each one interrelates with the others as an example of a real class setting. At one point the three of them will overlap. Around those circles is visualized a larger circle as an example of a human mind in which Jung believes we conceive our attitudes, perceptions, and judgments. Each of these functions moves in opposite directions, as an illustration that our style may be described using three

descriptors (attitudes, perceptions, and judgments) in different combinations while we deal with life's encounters, but being aware that one will be shown to dominate. Finally, I visualized this circle as an open one, because humans constantly use attitudes, perceptions, and judgments to make decisions.

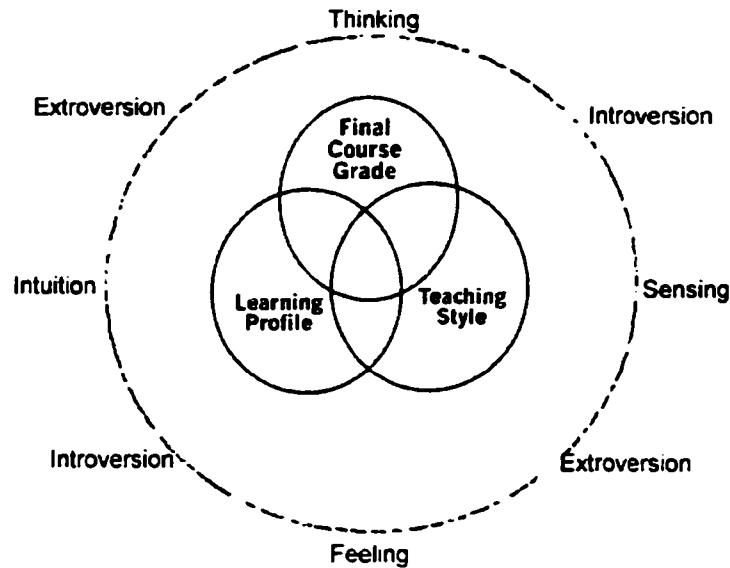


Figure 1. Theoretical conceptualization diagram based on Carl Jung's Theory.

Importance of the Study

This study is important to both educators and baccalaureate nursing program students. The results of the study will contribute to the body of knowledge in nursing and education in general. This study's findings have the potential to provide information on appropriate teaching styles that encourage optimal outcomes among nursing students.

Knowledge of the relationship between the learning profiles, teaching styles, and students' final course grades can guide curriculum and course development and contribute to improvement of the instructional process by faculty.

The learning profile assessment could be completed for all nursing students and used for advisement and planning as is currently done with other tests. Also, the assessment results could be used in nursing program designed to increase feelings of satisfaction with instruction, lower the attrition rate, attract more students to higher education in nursing, and improve the marketability status of the nation's professionals.

Knowledge of the relationship between the predominant learning profiles of baccalaureate nursing students and the nursing faculty's preferred teaching style has the potential to impact other factors in the learning environment, such as courses taught, program development, and individual faculty evaluation. Some of the possible practical results would be to provide significant evidence to:

1. Support the establishment of formal seminars to help faculty use a variety of teaching strategies to make more suitable the learning process for nursing students, especially during the first year of the nursing baccalaureate program.
2. Establish the need to make changes to the curriculum and instruction process in the nursing program.
3. Justify the need for faculty to have more academic preparation during the years of study, focused on the practical methods of teaching.
4. Justify a more comprehensive effort in the field of orientation and counseling directed toward first-year students.

5. Support giving a learning-style profile indicator to all nursing students to help them understand their own learning style and how to use it to their advantage.
6. Obtain significant data useful for discussion in nursing education literature in Puerto Rico and the U.S.

Definitions of Terms

For the purpose of clarification, the following definitions are established for use in this study:

Learning Profile: According to Keefe (1988), the cognitive, affective, and psychological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment (p. 3).

Teaching Style: The different ways people prefer to use their perception (sensing and intuition) and their judgment (thinking and feeling) to transmit or receive data. The preference for either type of perception function is independent of the preference for either type of judgment function. As a result, four distinct combinations occur: (1) Sensing-Thinking (ST), (2) Sensing-Feeling (SF), (3) Intuitive-Thinking (IT), and Intuitive-Feeling (IF).

Baccalaureate nursing student: A learner who enters a 4-year nursing program in a college or university after completing high school, a technical degree or has an associate's degree in nursing, with no prior nursing-related work experience or few years in nursing practice.

Nursing faculty: Individuals who have a baccalaureate or master's degree in nursing arts and/or science, with a minimum of 1 year of experience in nursing practice, and who teach in a public or private college or university baccalaureate nursing program.

Final course grade: The grade obtained at the end of the semester in each nursing course.

Years in nursing program: The time in years that the student has participated in the nursing program.

General Methodology

Quantitative research was used to explore the relationship among baccalaureate nursing students' learning profiles, nursing faculty preferred teaching styles, and final course grades. The formal research was conducted during the first semester of the 2001-2002 school year with nursing students of each year (1st, 2nd, 3rd, and 4th) of the baccalaureate nursing program at Antillean Adventist University, Mayaguez, Puerto Rico. Data on faculty teaching styles and nursing students' learning profiles were gathered using Teaching Style Inventory and Learning Profile Indicator respectively, designed by Dr. J. Robert Hanson and by Silver Strong and Associates, Inc., respectively. Teachers' grade reports were used to obtain final course grades. These data were analyzed using descriptive and inferential statistics to provide answers to the research questions. The findings are going to be presented during a meeting with the Nursing Program Dean and faculty.

Limitations and Delimitations

This study focused on the students and faculty in the baccalaureate nursing program at Antillean Adventist University in Puerto Rico. By nature of the research, the limitations included that the findings could be applied only to:

1. Nursing programs within 4-year colleges and universities.
2. One baccalaureate nursing program located in the western part of Puerto Rico.

This study was further delimited by utilization of consenting students enrolled in courses during August to December of 2001 at Antillean Adventist University.

Summary

Chapter 1 provided an introduction to the research topic with relevant background information. The problem statement, research questions, research hypotheses, and definitions of frequently used terms were presented. A statement of justification for the study and limitations and delimitations were also included. Descriptive information was given about baccalaureate nursing students, characteristics distinguishing them, nursing faculty members, and factors influencing the learning/teaching process. Nursing faculty, as part of the world of education, were recognized as having specific characteristics and expectations. Examining the relationship of predominant learning profiles among baccalaureate nursing students, the nursing faculty's preferred teaching style, and final course grades was viewed as having the potential to provide invaluable information for teachers, students, nursing programs, colleges, and university

administrators. This knowledge could facilitate more effective learning outcomes for students, and more effective teaching outcomes for nursing professors.

CHAPTER II

LITERATURE REVIEW

In this chapter, the reader can find a historical overview of learning theories and a summary of personality theory. It also contains definitions of concepts such as “teaching and learning styles” that have been found in the literature review, a description of the relationship between learning and teaching styles, a review of some instruments for the assessment of learning styles, and the reasons why a match between learning and teaching styles is important. Finally, a summary of the most recent trends in learning style research related to the field of nursing is included.

Historical Overview of Learning and Personality Theories

The historical overview of learning goes back to the Greek culture with Socrates. This philosopher proposed that an active, collaborative learning environment is appropriate for enhancing learning. His influence is still with us today since one of the teaching/learning techniques used by educators is the Socratic method of questioning (Allen, 1966). In the 4th century, BC, Plato added some significant contributions to education and learning. He was concerned about creating a high cognitive level of education, the promotion of cultural learning, teachers as central to the education process, and the comprehensive, systematic, and holistic approach to education and learning (Ozmon & Carver, 1976). Another great philosopher who made a contribution to this

field was Aristotle, a student of Plato's. He believed in the importance of ideas and in the value of study to increase knowledge (Allen, 1966).

It was later, in the 16th century, when Francis Bacon introduced his concerns about ways of thinking and the scientific method of investigation. A century later, John Locke (1632-1704) proposed the idea of "tabula rasa," or that we come into life with minds akin to a plain sheet of wax paper upon which experiences are written through the senses (Bennet, 1962). Locke realized that through experiences, individuals use their five senses to learn. Hundreds of years passed before scientific evidence was collected to determine how learning actually occurs.

Fizzell in 1984 explained that "learning style studies represent efforts to describe those individual differences to which we must respond so that all students' needs may be met" (p. 303). The study of how humans learn is shared by many disciplines. Physiologists, biochemists, and biophysicists all have a legitimate interest in the topic. The scientific study of learning is carried on primarily by psychologists, however, and for this reason it is very natural for psychologists to feel that the study of learning belongs to them. The preferences of the theorist often lead him to concentrate upon one kind of learning situation to the neglect of the others. By alerting the reader in this way, we can continue, mentioning that learning theories fall into two major families: stimulus-response conditioning theories and Gestalt-field cognitive theories. But, what is a learning theory? Bigge (1982) argues that it is "a systematic integrated outlook, regarding the nature of the process, whereby people relate to their environments in such a way as to enhance their ability to use both themselves and their environment more effectively"

(p. 3).

The classical heritage of learning theories was initiated in the 19th and 20th centuries with Edward L. Thorndike (1874-1949), one of the first American psychologists. He was the first to do learning experiments with animals. In his Connectionism learning theory, he initiated and conducted the use of empirical studies to investigate the process of learning (Hilgard & Bower, 1966). The basis of his theory is that there is an association between sense impressions and impulses to action. He identified the association as a “bond” or “connection” that becomes strengthened or weakened in the making and breaking of habits. Thorndike undertook a number of experiments to show that, even with human subjects, learning is an automatic process that builds a direct connection between a stimulus and a response with minimal conscious awareness. His contributions can be summarized as follows: (1) he broke down the ideas of dualism, such as a man-animal existing at the turn of the century; (2) he provided the new alternative idea that learning involves association, but as stimulus and response elements that are connected; (3) he gave us the modern concept of reinforcement; and (4) he initiated a laboratory to study animal learning (Bolles, 1979, p. 18; Hergenhahn, 1982, p. 398; Mowrer & Klein, 2001, p. 5). At the time Thorndike was doing his major research, Pavlov was also investigating the learning process. Ivan Petrovich Pavlov (1849-1936) was a Russian physiologist who conducted studies on conditioned reflex with the digestive systems of dogs. It is important to understand that his Theory of Conditioning was not to establish a theory of learning, but rather to develop techniques for studying the brain or “psychic.” This theory can be summarized as follows: (1)

conditioning is a hypothetical process by which a response comes to be elicited by a conditioned stimulus that does not elicit it initially; (2) conditioning occurs when the conditioned stimulus is consistently paired with an unconditioned stimulus that elicits a response; and (3) all learning in man and beast is due to conditioning (Bolles, 1979, p. 37; Hergenhahn, 1982, p. 169; Mowrer & Klein, 2001, p. 23). Another person who made important contributions to this field was John B. Watson (1878-1958). His theory proposed that when a stimulus and response occur at the same time, the connection between them is strengthened (Bolles, 1979, p. 46; Mowrer & Klein, 2001, p. 2).

Edwin R. Guthrie (1886-1959) was also an important contributor to the development of learning theory. He maintained that learning occurs all at once. A given response becomes connected with a given stimulus in one trial (Bolles, 1979, p. 58). His work can be described as an extension of Pavlov's and Watson's theories. A person who stood well outside the mainstream of learning theory was Edward C. Tolman (1886-1959). He did not see behavior as reflecting an automatic response to some environmental stimulus but rather as having direction and purpose in terms of obtaining some desired goal (Hilgard & Bower, 1966, p. 191; Mowrer & Klein, 2001, p. 11). His unique and enduring contribution was primarily to relate his perception of the behavior of animals, rather than any systematic statement of learning principles (Bolles, 1979, p. 88).

Finally, Clark L. Hull (1884-1952) and B.F. Skinner (1904-1964) form part of the classical group of theorists. They are associated with the reinforcement group of learning theories. Hull's Drive-Stimulus Reduction Reinforcement Theory was based on the notion that drive, learned or innate, automatically motivates behavior. He stressed

conditioning as the basic learning process. Also, in Hullian reinforcement, the stimulus and the response are not simultaneous; the stimulus precedes the response (Bigge, 1982, p. 94; Hilgard & Bower, 1966, p. 146). In Skinner's Operant, Instrumental Conditioning an organism must first make the desired response and then a reward is provided. He argues that the reward reinforces the response and makes it more likely to recur (Bigge, 1982, p. 95; Marx, 1970, p. 55).

The second major family of contemporary learning theories is the Gestalt-field family of cognitive theories. The origins of Gestalt-field psychology started in Germany during the early part of the 20th century. Gestalt field psychologists consider learning phenomena to be closely related to perception (Bigge, 1982, p. 59). It was Max Wertheimer who first stated formally the position of this theory in 1912. The theory was introduced into America in the middle 1920's by Wolfgang Kohler and Kurt Koffka. Gestalt laws imply that, in perception, one's organization of a field tends to be as simple and clear as the existing conditions allow (Bigge, 1982, p. 59). Within this theory, learning is neither equated with enfoldment and sheer expression of inner urges, nor is it a conditioning process, which comes from the environment impinging upon a biological organism from without.

Cognitive-field learning theory emerged as a newly oriented current synthesis whose basic paradigm or model centers upon a person's interaction with his contemporaneous psychological environment (Bigge, 1982, p. 169). Cognitive learning theory pictures the organism as handling information or processing information by combining neural processes into larger functional units and then operating in terms of

these (Marx, 1970, p. 245). The pioneer in this field was the German-American psychologist Kurt Lewin (1890-1947). Some of the psychologists whose work made contributions to the cognitive-field theory include Gordon Allport, John Dewey, Albert Bandura, and Jerome Brunner. The cognitive-field theory of learning describes how a person gains understanding of himself and his universe in a situation so construed that both he and his psychological environment compose a totality of mutually interdependent, coexisting factors (Bigge, 1982, p. 172).

Finally, Sigmund Freud's (1856-1939) Psychoanalytic Theory has some parallels with conventional interpretations of learning and is very useful to show how relevant psychoanalysis is to learning. The significance of Freud's theory as it relates to learning theory has been: (1) to broaden the topical content studied within the field of learning; (2) to reveal how the conception of unconscious determination has made important changes in thinking about human motivation; Freud was the first to propose that repression leads to the inability to verbalize; and (3) to show how the genetic or developmental aspects of psychoanalysis have brought to the need for an adequate ego psychology (Hilgard & Bower, 1966, p. 264).

This brief historical background of the two major families of learning theories brings us to a better understanding of the different mainstream theories prevailing into the 20th century.

Personality Theory

For this study it is very important to review personality theories, because the theoretical framework is designed using Carl Jung's Psychological Types Theory. There is as yet, no single, universally accepted definition of personality, but three common definitions found in the literature are the following:

1. Personality is "the underlying causes within the person of individual behavior and experience" (Cloninger, 2000, p. 3).
2. Personality is "important and relatively stable characteristics within a person that account for consistent patterns of behavior. Aspects of personality may be observable or unobservable, and conscious or unconscious" (Ewen, 1998, p. 5).
3. "Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment" (Allport, 1966, p. 48).

These definitions provide the basis for the development of the different theories related to personality. The scientific study of personality builds on philosophical discussions of human nature. As a field within modern psychology, the study of personality has roots in both the clinical tradition of psychotherapy and the scientific tradition of empirical research. Personality theories originate in the clinical practice of psychoanalysis, as represented by Sigmund Freud, Carl Jung, Alfred Adler, Karen Horney, Erik Erikson, Carl Rogers, and George Kelly (Ewen, 1998). Theories proposed by B.F. Skinner and Arthur Staats, and Albert Bandura and Walter Mischel, belong to the group of personality theories developed outside the clinical setting. This group of

theorists believes in improving adaptation by teaching people more effective behaviors and more effective ways of thinking about themselves and their life tasks. Other perspectives, such as The Trait Perspective, include Gordon Allport and Raymond B. Cattell's work in clinical diagnostic questionnaires, and are unified as a portrait of healthy functioning (Cloninger, 2000, p. 469). Some contributions of the various personality theories are: (1) the importance of individual differences; (2) the realization that personality can be evaluated along a dimension of health or adjustment; (3) the usefulness of the cognitive concepts for the understanding of personalities; (4) the realization that personality is expressed through behavior in the social world; (5) the biological influences in the psychological processes; (6) the fact that important personality development occurs in childhood; and (7) the fact that adult personality development builds on the foundation of personality developed in childhood.

Two classic examples of personality theories are Freud's Classical Psychoanalysis and Jung's Analytical Psychology (Ewen, 1998, p. 15). The assessment instrument used in this study has as its basis Jung's theory (described in more detail in the theoretical framework) and was created by Silver and Hanson (1980; Hanson, 1997). Carl G. Jung (1875-1961) was a psychiatrist who lectured at the University of Zurich. He supported Freud's work on psychoanalysis in his own professional writings (Cloninger, 2000, p. 71). His major work was the book *Psychological Types*, where he presents the fact that besides the many individual differences in human psychology, there are also typical differences (Jung, 1923). In Jung's work, *Psychological Types*, he describes what are called "learning styles" or "cognitive styles." They represent the way we prefer to

perceive and judge the information we encounter as we go through life, constantly adapting to a variety of situations (Bargar & Hoover, 1984).

What Are Learning and Teaching Styles?

Learning Styles

A variety of definitions for the term “learning style” can be found in the literature. At the beginning of research related to this area, the term “cognitive style” was used rather than learning style. Kuchinskas (1979) defined cognitive style “as the way an individual acts, reacts, and adapts to the environment” (p. 269). In *Learning Styles: A Review of the Literature* (1982), Semple mentions that cognitive style has been defined in several different ways, taking into consideration cognitive characteristics, modes of functioning, and individual differences in cognitive operations such as personality, perception, and intrinsic information processing patterns (pp. 1, 2). Cornett (1983) defines it as a consistent pattern of behavior, but with a certain range of individual variability (p. 9). In the psychological area, learning is one of the most important concepts. Hergenhahn, in 1982, mentions that the most popular definition between the psychologists is the one suggested by Kimble, which defines learning “as a relatively permanent change in behavioral potentiality that occurs as a result of reinforced practice” (p. 3). Finally, in order to conduct investigations in the field of learning style, The National Association of Secondary School Principals (NASSP), in 1984, adopted Keefe’s definition of learning styles, in which he established that they are characteristic cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners

perceive, interact with, and respond to the learning environment (Keefe, 1984). As a researcher, the definition that best focuses on all the components that form the human being, is the one from Keefe. Consequently, for the purposes of this study, I will comment and focus on the investigation of Keefe's 1984 definition of learning styles.

Researchers in the field of learning styles have developed various learning style paradigms in order to establish the individual accustomed ways of learning. In 1982, NASSP described the basis of the learning-style paradigm as including personality theory, the information processing aspect of cognitive style research, and research on aptitude-treatment interaction (Keefe & Ferrell, 1990). Moreover, Cornett (1983) claimed that learning styles have cognitive, affective, and physiological aspects (pp. 9-11). Those aspects are described in the following form:

1. *Cognitive* aspects are internal to the information-processing system and require careful training for any adaptive change.
2. *Affective* aspects include emotional and personality characteristics related to such areas as motivation, attention, locus of control, interests, willingness to take risks, persistence, responsibility, and sociability.
3. *Physiological* aspects include sensory perception (visual, auditory, kinesthetic, taste, and olfactory), environmental characteristics (noise level, light, temperature, and room arrangement), the need for food during study, and the preferred times of day for optimum learning.

In studying learning styles it is necessary to research all these aspects to be sure that we are not ignoring the elements that have superior potential for stimulating learning.

Knowing that these elements are linked to learning, I identify the possible relationship that can exist between a teacher's teaching style and a student's learning style, together with the final course grade in one four-year nursing program in Puerto Rico. Carl Jung's Psychological Types theory, and Hanson and Silver's assessment instruments were utilized to facilitate this investigation. The selection of Jung's theory provided a framework for this investigation is based on literature findings that establish an intimately interwoven relationship between learning styles and the affective, temperamental, and motivational structures of the total human personality. The selection of the investigation's instruments was based on taking into consideration that, in the nursing field, more of the research related to learning styles and teaching styles was conducted using a variety of assessment instruments. It has been found that the most closely linked instruments to Jung's theory are the ones originated by Hanson and Silver. Using these instruments which support Jung's theory, I found new information which is useful in improving the nursing curriculum and the instructional process in Puerto Rico and other parts of the world.

Teaching Styles

In 1979, Kuchinskas saw in a visit to a classroom, that the teacher's cognitive style determined how students would learn. Applying this to the classroom setting, the form in which a teacher acts, reacts, and adapts to the teaching environment is defined as his teaching style. Hanson and Silver (1982) suggest that one's teaching style represents a conscious or unconscious enacting of the ways one prefers to learn and remembers being

taught. In 1985, Conti argued that the overall traits and qualities that a teacher displays in the classroom, and that are consistent for various situations, can be described as a teaching style. Fisher and Fisher (1979) indicate that there are several teaching styles, such as: the task oriented; the cooperative planner; the child-centered; the subject-centered; the learning-centered, and the emotionally exciting, as well as its counterpart (p. 6). Teaching styles may be characterized according to: (1) instructional modes, such as recitation, lecture, discussion, inquiry, or role playing; (2) terms of teaching models: such as social interaction, information processing, personal source, and behavior modification; (3) a dichotomous fashion: authoritarian versus democratic, pupil-centered versus teacher-centered, traditional versus progressive, direct versus indirect, and formal versus informal; or (4) in terms of one's instructional decision-making tendencies: such as sensing/thinking, sensing/feeling, intuitive/thinking, and intuitive/feeling.

Each one of these teaching styles may involve different variables which manifest themselves through a variety of classroom activities (Silvernail, 1986, p. 16). Some of the components of different teaching styles include the following: feedback (effects of praise, effects of criticism, use of pupil ideas), the use of questions, structuring activities, clarity of presentation, task-oriented teaching styles, enthusiastic teaching, classroom reward structures, student perceptions of classroom climate, and teaching behaviors. For purposes of this research, the teaching style categories as developed and describe by Hanson and Silver was used to identified the nursing faculty teaching style. Hanson and Silver (Hanson, 1997; Silver, 1980) developed their styles based on the way teacher prefer to use their perception (sensing and intuition) and their judgment (thinking and

feeling). They identified four styles: Sensing-Thinking, Sensing-Feeling, Intuitive-Thinking, Intuitive-Feeling.

Table 1 shows learning behaviors on activities associates with each style.

Teaching is complex at may involved many variables but the critical issue is to use this information to meet the educational need of the learner while obtaining satisfaction for educators.

Table 1

Learning Behaviors and Activities by Style

Interpersonal/Social	Mastery	Understanding	Self Expression
Sensing-Feelers	Sensing-Thinkers	Intuitive-Thinkers	Intuitive-Feelers
Teachers			
Nurturers, Supporters	Trainers, Information givers	Theoreticians Inquirers	Facilitator Stimulators
Learners			
Sympatetic, Friendly	Realistic, Practical	Logical, Intellectual	Curious, Insightful
Curriculum			
Positive self-concept	Knowledge	Critical Thinking	Creative Expression
Setting			
Personal warmth	Purposeful work	Discovery	Originality
Operations			
Describing feelings	Observing	Classifying	Hypothesizing
Teaching Strategies			
Circle, role playing	Command, task	Problem solving	Synectics
Student Activities			
Group projects	Workbooks	Essays, Debates	Creative art activities
Evaluation			
Oral reports	Checklists	Open-ended questions	Fluency of expression

Relationship Between Teaching and Learning Styles

Just as there are many identifiable learning profiles, there are also many identifiable styles of teaching. The recent commitment to individualized instruction and the effort to lower the dropout rate should force researchers to reexamine teaching styles (Fisher & Fisher, 1979, p. 251). This commitment has its roots in the learning style approach referred to as the school-oriented approach. The Individually Guided Education (IGE) was one of the first systematic efforts at individualizing instruction and is the most thoroughly researched area of the whole field. The unique role of teachers in our culture is to preserve and improve the culture as well as their own relationships to their students (Bigge, 1982, p. 281). Assessing learning styles provides today's teachers with a new direction to take toward developing a more personalized form of instruction. Once teachers gain an appreciation of the variety of learning styles, they can respect learning style differences and adapt their teaching style for different situations. Whatever the teacher's learning style, it will have an effect on his or her teaching style (Cornett, 1983, p. 14). It is further suggested that learners are attracted to disciplines with learning environments comparable with their own learning style, and that these styles are further accentuated with experience in the discipline. Canfield's 1980 analyses of learning style preferences among program majors appears to be consistent with this expectation. Findings show that education and criminal justice students favor organization, while business and data processing students have a low interest in people; data processing students prefer detail, organization, and numbers; and art history students are interested in inanimates, icons, and are less interested in numeric activities (Heikkinen, Pettigrew, &

Zakrajsek, 1985, p. 80). Miglietti and Strange (1998), talking about the increase in college enrollments, argue that serving students well should include examining students' preferences for different teaching styles as well as their expectations of the classroom environment. It is believed that through understanding the relationship between learning styles and teaching styles most of the instructional needs of the student population would be supplied while their academic achievement and satisfaction level might also be improved.

Research on Instruments to Identify Learning and Teaching Styles

There are a variety of commercially published instruments to measure one or many aspects of learning style. In selecting a learning style instrument, educators need to consider the validity, cost, time to administer, ease of interpretation of the instrument, and whether teachers can and will use the results it yields. During the 20th century, a many researchers have distinguished themselves through their studies related to the area of learning styles. Their work is closely related to the use of instruments to identify these different learning styles. A test collection from the Educational Testing Service, based on instruments for teaching style assessment and a selected bibliography of the available instruments for assessing various aspects of learning styles prepared by Cornett in 1983, includes the following examples: The Multidimensional Instruments, the Cognitive Style Instruments, the Affective Style Instruments, and the Perceptual Modality Instruments. Some of the most widely used instruments in educational literature, as well as in nursing research, will be mentioned as follows:

1. The Learning Style Inventory by David Kolb (1981), a self-report rank ordering format, used with upper-grade students to identify one of four learning modes: feeling, watching, thinking, and doing;
2. Herman Witkin's Group Embedded Figures Test, in which he works to identify how accurately one can pick out a simple object within the context of more complex figures (Witkin et al., 1962);
3. The Learning Style Inventory (1978), by Joseph Renzulli and Linda Smith, for teachers or students, to measure attitude toward nine modes of instruction;
4. The Learning Style Inventory for students (1978) and the Productivity Environmental Preference Survey for Adults (1977) by Rita Dunn, Kenneth Dunn, and Gary Price, which yields information about how a given student learns;
5. The Learning Style Inventory (1976), by Albert Canfield and Judith Canfield; a self-report instrument based on a rank ordering of choices for 30 questions; and the Instructional Styles Inventory, used by instructors in educational and business settings to identify the conditions under which they teach best;
6. Anthony F. Gregorc's Transaction Ability Inventory (1982), a self-report instrument based on rank ordering of words to reveal four combinations of learning preference dualities: abstract sequential, abstract random, concrete sequential, and concrete random;
7. Isabel Myers and Katherine Briggs' (Myers, 1977) Myers-Briggs Type Indicator; applying Jung's work to create an instrument designed to identify individual cognitive preferences through the use of a self-report test for Grades 9 through college

level and for adults (Morgan, 1997; Quenk, 2000); and

8. J. Robert Hanson's (1997) Learning Profile Indicator and Harvey Silver's (Silver et al., 1980) Teaching Style Inventory; self-report tools which attempt to identify each different type's interacting preferences, based on Jung's personality dimensions.

Teaching and Learning Styles: The Match

The issue about matching a teacher's instructional style with students' learning styles is not as simple as it appears. In the literature review I found studies that researched the possibility of a learning increase if the students' styles match with their teacher's styles (for example, Pollick, 1993). But the findings are inconclusive because they do not find a significant relationship between teaching and learning styles. There are many reasons for trying to match the styles. One of them would be to improve attitude, decrease anxiety, or strengthen a particular cognitive style. Another might be to expose the learners to different style models in order to learn to use alternative ways of thinking, perceiving, or feeling, or to increase the options when transmitting the goal of a given lesson in a group with different styles. Finally, understanding this relationship would increase the feeling of satisfaction during the teaching/learning process. These reasons can be validated during the teaching and learning of a lesson in a daily life encounter or an actual experience in the classroom.

Approaches to the Study of Learning and Teaching Styles in Nursing

It is noted that models of learning in nursing education reflect and pursue the notion of learning from practice and the location of theory in practice (Benner, 1984). A possible reason for this may be supported by the history of the nursing curriculum that has been prescribed for 35 years by the Tylerian/behaviorist curriculum-development paradigm (Bevis & Watson, 2000, p. 2). It has also been argued that nurses appear to learn more from practical clinical activities than from other learning activities (Harvey & Vaughan, 1990). Literature findings demonstrated a predominance of concrete learning styles and a preference for teacher-structured environments (Carbo & Hodges, 1988; Laschinger, 1992; Nagata, 1996). In looking to learning/teaching preferences, Wells and Higgs (1990) identified that demonstration and practice was the overall preferred choice of student nurses. However, Gott (1982) informs us that lecturing as a teaching method remains the traditional approach used by nursing teachers. The determinants of success in nursing education, with a particular focus on personality characteristics and learning styles, were investigated by Fladeland in 1995. The results were that nursing students who completed the program had significantly higher scores in Sensing and Judging. All students who completed programs, regardless of race or gender, were more likely to prefer a sensing (concrete) learning style. In the field of nursing there exists a group of researchers who have made important contributions to the area of learning styles and teaching styles. Some of their studies have been developed using a number of the instruments already mentioned. In 1989, Linares conducted studies to compare the

learning characteristics of RN and generic (students who came from high school) nursing students. She found that there are no wide differences in learning characteristics between generic and RN students. Similarly, Well and Higgs (1990) made a comparison of the learning styles and learning preferences of first and fourth-semester baccalaureate nursing students, as well as exploring changes in learning styles and learning preferences from first to fourth semester. She found no significant changes in learning style scores from first to fourth semesters. Another study, *Learning Style Differences: Registered Nurse Students Versus Generic Student Nurses at the Baccalaureate Level*, was realized by Lassan in 1984. The findings indicated that the groups were similar in learning styles. Henderson (1997) studied the relationship between learning styles and perceptions of effective teacher characteristics among adult and traditional-age learners in baccalaureate programs of nursing. She found that there was no significant relationship between the predominant learning style of adult and traditional learners in these programs. Pollick (1993) investigated whether teachers in nursing education taught in the same styles in which they preferred to learn, if the teaching styles used were the same or different from those preferred by nursing students, and the relationship between the teachers' teaching style, the learners' learning style and the grade obtained in a nursing course. The findings were that many teachers preferred the same teaching style, and that 14.5% of the students had no teacher who preferred to teach in their style. Henderson (1996) investigated the relationship of learning styles and perceptions of effective teacher characteristics among adult and traditional-age learners in baccalaureate programs of nursing. She found that there was no statistically significant relationship between the predominant learning style

of adult and traditional learners in baccalaureate nursing programs and their perception of effective teacher characteristics. Merritt in 1983 conducted an investigation to determine the relationship of age, and professional nursing employment experience to learning style preferences of basic and RN students respectively, and the differences in learning style preferences of basic and RN students. The findings did not support the propositions that age or length of career employment account for differences in the ways adults prefer to learn. Also, it had been inferred from adult learning theory that RN baccalaureate nursing students, when compared to basic baccalaureate nursing students, would express a higher preference for the achievement condition and the iconic and direct experience modes of learning and a lower preference for the structure, affiliation, and eminence conditions and the listening and reading modes (p. 371).

Finally, a series of studies in other fields reflects Linares's research (1999), which was conducted to determine if the students and faculty of nursing and other allied health programs demonstrated a predominant learning style. The results showed no significant differences in learning style between students and faculty. Payton, Hueter, and McDonald, in 1979, realized a study to describe the learning style preferences of students enrolled in their first year of basic professional programs in physical therapy in the United States during the years 1975 to 1976. The results indicated that the "typical" or average physical therapy student preferred organization in the curriculum and a close working relationship with the instructor, while disliking competition (p. 152). Vittetoe and Hooker, in 1983, conducted a 3-year study of the learning style preferences of allied health practitioners in a university teacher education program. Results indicated that

medical technologists and physical therapists preferred concrete and teacher-centered learning styles (p. 48). Another investigation was conducted by Rogers and Hill in 1980 to study the learning style preferences of two classes of occupational therapy students. The results indicated that both bachelor's and master's students preferred learning experiences that were teacher-structured, concrete, and interpersonal. The study also suggested that an instructional program could influence learning style preferences (p. 789). Currently in Puerto Rico, we only know about longitudinal, yet unpublished studies relating to learning styles, but do not yet have conclusive research establishing the relationship between nursing teaching styles and students' learning styles in a baccalaureate nursing program. Through the literature review and the research findings of this work I hope to awaken an interest in this kind of research. All of these findings, based on the research in learning and teaching styles, help us to understand the complexity of learning and to better appreciate the role of teachers in the learning process.

CHAPTER III

METHODS

The purpose of this investigation was to study the relationship among the predominant learning profile of baccalaureate nursing students, the nursing faculty's preferred teaching styles, and the students' final course grades. Data were gathered through the use of two self-report instruments: (1) the Teaching Style Inventory (TSI) and (2) The Learning Profile Indicator (LPI). Final course grades were also obtained from each faculty. This chapter presents a description of the population and the procedure for selecting the subjects, as well as identification of the independent and dependent variables of the study. The research hypothesis in null form is stated, and the instruments used are described, including the procedures for demonstrating validity and reliability. Finally, the procedure, collection, and treatment of the data are presented.

Population and Sample

The selected population for this investigation was the nursing students and nursing faculty in a private Seventh-day Adventist university on the western side of Puerto Rico. The entire nursing faculty and nursing students in the baccalaureate program at Antillean Adventist University (AAU) in Mayaguez, Puerto Rico, were used in this study.

The population of nursing students has the following characteristics: They come from the public and private academic sectors of various parts of Puerto Rico, the Virgin Islands, North America, Central America, and South America. Over 80% are female. Students who come from a college need a GPA of 2.30 to be admitted to the nursing program. If they come directly from high school, the requirement is a GPA of 2.50. The overall age of students in the program is between 18 and 21 years. They have a variety of religious preferences, and the majority belongs to the lower-middle economic class.

All full- and part-time nursing faculty of the AAU Nursing Department were invited to participate in the study. All of them have a master's degree in nursing with different areas of specialty. Each nursing professor teaches about two to three courses each semester according to their expertise area. Before entering the nursing program at AAU, they have at least 1 year of experience as nursing teachers in other nursing schools as well as 5 years as a hospital registered nurse. All belong to the Seventh day Adventist Church and some of them are members of the university church.

Study Variables

As presented in chapter 1, the independent variables of this study are the year the student is in the nursing program (class standing), student learning profile, and faculty-preferred teaching style. The dependent variable of this study is the final course grade. For the purpose of this study, year in nursing program is defined as the academic classification (1st year, 2nd year, 3rd year, 4th year) under which the student was placed at the time this study was conducted. Student learning profile is defined as the total score

obtained through the instrument Learning Profile Indicator (LPI) and faculty preferred teaching style is defined as the total score obtained through the Teaching Style Inventory (TSI). Both instruments categorize the individual into one of four learning or teaching styles: Sensing-Thinking, Sensing-Feeling, Intuitive-Thinking, and Intuitive-Feeling. Final course grade was operationally defined as the percentage score that each student obtained in the course taken during the semester this study was conducted.

Instrumentation

For this study I used two self-report instruments developed by Hanson and Silver entitled the Learning Profile Indicator (LPI) and The Teaching Style Inventory (TSI). I obtained written permission from the instruments' author, Dr. J. Robert Hanson, to use and to translate them into Spanish, the language of the population for this study (see Appendix C). After the instruments were translated, two other bilingual persons translated the Spanish version back into English. This procedure helped ensure that the meaning of each item in the instruments had not been compromised.

Pilot Study

Before the official data collection was carried out, a small-scale version or trial run of the study was done. This pilot study sought to validate the adaptive version of the LPI and TSI questionnaires. The trial was done at AAU, choosing 10 professors and 15 students from academic areas other than the nursing department. On a specific day all the teachers and the students met with me and completed the test. I completed this study a few weeks after the academic semester started. The following week the data were

analyzed. Based on the findings, I made the following adjustments: (1) more time to complete the questionnaires; (2) carefully explained the instructions for completing the questionnaires, and (3) clarified the persons mentioned in question #44.

Description of Instruments

The Learning Profile Indicator (LPI) and The Teaching Style Inventory (TSI), self-report instruments based on Carl G. Jung's Theory of Psychological Types, were developed by Dr. J. Robert Hanson and Harvey Silver to provide a measure of self-understanding for the learner and the educator. Both instruments are classified as behavior ranking scales, using forced choice and ranking of four alternatives. For this study, the LPI and TSI were translated from English into the Spanish language, with consent of the authors (see letter in Appendix D).

The Learning Profile Indicator

The Learning Profile Indicator (LPI) was developed as a diagnostic tool to help individuals identify their own learning profile based on how they collect information, make judgments, processes data, and form conclusions. The instrument is divided into two parts: A-forced choice and ranking on fifty sets of behaviors, and B-self-reflection and ranking of four sets of style descriptors. Only Part A was used for this study. Part A (self-descriptors) consists of 50 sets of behaviors divided into sets of four, where the participants are instructed to rank the words in each set based on how they think about themselves as learners. For example: *When I'm learning something new I tend to be: creative, self-reflective, organized, analytical.* Using five as the total number of points to

distribute and assign within each four word set, the participants are asked to distribute the number values according to which words/phrases best represent their own identification of a preferred choice when learning something new.

To determine their learning profile, participants were instructed to transfer the data to the Scoring Self-Descriptors sheet, tabulate sub and grand totals, and compare the results with the score scales provided. The instrument also provides instructions to identify the attitudes and orientations that act as modifiers of the style (see a copy of the instruments in Appendix A). Completion of the LPI takes about 40 minutes.

The Teaching-Style Inventory

The primary use of the TSI is to help teachers identify a preferred teaching-style profile based on their instructional decision-making categories, including their teaching behaviors. It also helps teachers identify the degree to which they can adapt and be to diverse learning styles. The instrument has 56 descriptors organized in sets of four divided among 7 categories: Planning, Implementing, Setting, Curriculum Objectives, Operations, Roles, and Evaluations. Participants rank order the descriptions that best reflect the way they make instructional decisions. They assign a 5 to the behavior that is the best measure of tendency; a 3 to the second best; a 1 to the third; and a 0 to the least used response. The items in each category correspond to four different teaching styles based on how people prefer to perceive (sensing and intuition) and form judgments (thinking and feeling). The preference for each type of perception function is independent of the preference for either type of judgment function. The score for each participant is

obtained by transferring the rank numbers to the scoring teaching-preferences sheet into four columns (SF, ST, NT, and NF). The dominant style is the column with the largest number. The instrument takes about 25 minutes to complete.

Reliability and Validity of the Instruments

Dr. J. Robert Hanson (personal communication, June 15 and 20, 2001, and July 11, 2001) described the reliability and validity of these self-report instruments. He stated that reliability is limited to test-retest reliability at short time intervals. When the retest was administered, approximately 30 days later, the LPI test coefficient was 0.6). Regarding validity, Dr. Hanson explained that there are only two useful statistical applications: face or construct validity, and factor vector validity. Construct validity was tested by making comparisons between the LPI and the Myers Briggs Instrument, and from professional judgments of Jungian-typology experts. Factor validity was obtained by using the Q factor technique utilizing the SAS software. The initial factor analytic work was conducted in 1974 at Rutgers University under the direction of Dr. Eichenberry. The instrument was further refined through testing directed by Dr. Gulkus at Beaver College in 1980. The final version analysis of the LPI generated a 200-by-200 matrix of inter-item correlations as input for the analysis (Dr. J. Robert Hanson, personal communication, June 15, 2001).

The Teaching Style Inventory “has face validity because it provides a profile or picture of how the teacher perceives him/herself making instructional decisions” (Dr. J. Robert Hanson, personal communication, June 20, 2001). The TSI was developed to be

used as a measure of variance, to provide educators with a picture of how they are teaching (Dr. J. Robert Hanson, personal communication, June 20, 2001). Both instruments have been in use for over 20 years. Educators in grade schools through colleges have found them to be reliable measures of teaching and learning styles. Joy M. Reid (1993) recommended the use of the TSI developed by Harvey F. Silver and J. Robert Hanson as a self-diagnostic tool to identify one's preferred teaching style (p. 278).

Demographic Data for Nursing Faculty

I developed a demographic Faculty Sheet questionnaire specifically for this study. Similar questionnaires have been used in other research. The questionnaire asked for general information including age, academic classification, years of work experience, high-school GPA, ethnicity, previous educational experience (high school, college, or university), and level taught (see Appendix E). Participants were instructed to circle a number in each category that indicated the most descriptive choice for them among the options. The demographic data sheet for nursing faculty contained three items. Item 1 asked teachers to indicate their age by circling the appropriate range of years: 26-30; 31-35; 36-40; 41-45; 46-50; 51- 55. Item 2 asked teachers to circle the range that included their total years of teaching experience. Item 3 asked teachers to indicate the year level of the students they teach: first year, second year, third year, or fourth year.

Demographic Data Sheet for Nursing Students

The demographic data sheet for nursing students has five items. Item 1 asked students to indicate their age by checking the appropriate choice from among scales, such

as 17-20; 21-24; 25-29; 30-34; 35-39; 40, or more. Item 2 ask students to indicate the numbers of years in the nursing program (circling the correct option between six possible alternatives). For item 3, students indicate their academic level by circling one of the four choices: first year, second year, third year, or fourth year. Item 4 was related to the place of academic origin of the students. One of two choices could be made by circling the appropriate place of academic origin (see appendix F).

Final Course Grade Report

I requested from the teachers a copy of the final course grades (for each class of students) prepared at the end of the semester for the nursing courses taught. The grading scale used by the nursing faculty at AAU includes A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F. A passing grade in nursing department courses needs to be at least 77% (C+). For the purpose of this study, final course grade was operationally defined as the percentage points obtained by the student and were used as the dependent variable.

Ethical Considerations

Prior to beginning the study, a proposal was submitted and approved by the Institutional Review Board at Andrews University. After the review board approved the proposal all the subjects were asked to give their permission to be included in the investigation. Nursing students who voluntarily participated received an instruction sheet on how to complete the documents required for this study. I requested permission from the Dean of the nursing department to obtain a copy of the final course grades from each

nursing professor for each class that participated in this study. The faculty was assured that no names would be released in this study; student anonymity was protected.

Data Collection Procedures

A letter was sent to the dean of the AAU nursing program asking for permission to conduct the study at her institution. The number of participants was 138 nursing students and 9 nursing faculty members. During the first staff meeting of the nursing faculty (of the 2001-2002 school year), I presented a formal description of the study, asked for participant consent, and gave the Teaching Style Instrument to the nursing faculty who voluntarily agreed to participate. (The estimated time to take the TSI was about 30 minutes.) The collected documents were kept in a secured location in the nursing dean's office until the data analysis procedure began. During the month of September (2001), I made an appointment with the teachers in the nursing program to visit each of the nursing classes in order to ask students for their consent to be involved in the study, and to give all who voluntarily consent to participate the Learning Profile Indicator (LPI) Instrument (see appendix G). The estimated time to take the LPI was about 30 minutes. Each student packet contained a cover letter explaining the purpose of the study, a consent form asking for authorization to use their final course grade as part of the investigation, a demographic data sheet, and a copy of the LPI. Participation was voluntary; any student was able to choose not to accept or complete the survey. Completed documents were stapled closed and kept in a secured place until they were analyzed to maintain the integrity of each student's responses. Anonymity was preserved

by omitting names on all data-gathering instrument forms. A letter of appreciation was mailed to the program administrator, and, during the last social activity of the semester offered by the nursing faculty to all the nursing students, I made public recognition and appreciation to the persons who participated in the study.

Null Hypotheses

The following are the null hypotheses were tested in this study:

1. There is no relationship between student learning profile and years in nursing program.
2. There is no relationship between the nursing faculty preferred teaching style and the predominant learning profile of each group of nursing students in this 4-year nursing program.
- 3a. There is no relationship between student learning profiles and final course grade.
- 3b. There is no relationship between faculty teaching preferences and final course grade.
- 3c. There is no interaction between student learning profile and faculty teaching preferences.

Data Analysis Procedures

The data was summarized and analyzed using frequency distribution, means and standard deviation, Chi-Square test of association, and 2-way Analysis of Variance. The first and second null hypotheses were tested using Chi-Square test of association, since

both variables (learning style and year in nursing program in Hypothesis 1, learning style and teaching preferences in Hypothesis 2) are nominal (Hinkle, Wiersma, & Jurs, 1998; Maruyama & Deno, 1986). To meet the assumption for the appropriate application of Chi-Square (no more than 20% of the cells have expected frequency of less than 5), some cells were combined (Hinkle et al., 1998; Maruyama & Deno, 1986). Null Hypotheses 3a through 3c were simultaneously tested using 2-Way Analysis of Variance. This analytical technique allows one to examine both main effects (effect of learning style on final course grade, effect of teaching preference on final course grade) and interaction effects (effect of learning style on final course grade may be dependent on effect of teaching preferences). All null hypotheses were tested at the 0.05 level of significance.

Summary

In this chapter, the selection of the sample, instrumentation, data collection procedure and data analysis were described. In the following chapter, the results of the analyses are presented.

CHAPTER IV

RESULTS OF THE STUDY

Introduction

The purpose of this study was to investigate the relationship between students' predominant learning profile, nursing faculty teaching styles and the final course grade. The samples were students and faculty of the Department of Nursing at Antillean Adventist University, Puerto Rico. This study was conducted through the use of two self-report instruments: (1) the Teaching Style Inventory (TSI), and (2) The Learning Profile Indicator (LPI). The students' final course grade served as the dependent variable. The following specific research questions were especially of interest: (1) What is the relationship between learning profile of nursing students and years in nursing program? (2) What is the relationship between the nursing faculty preferred teaching style and the nursing students' learning profile in the 4-year nursing program? and (3) What is the relationship between the predominant learning profile of each group of nursing students, the nursing faculty preferred teaching style, and the final course grades? This chapter presents a description of the sample, the results of the study, and a summary. All analyses were done through the use of the Statistical Package for Social Sciences (SPSS). Hypotheses were tested at the 0.05 level of significance.

Description of the Sample

The participants of this study were all the teachers (9) and the students (138) from a Baccalaureate of Science in Nursing program (BSN) at Antillean Adventist University, Puerto Rico.

The Students' Demographic Characteristics

Table 2 presents a summary of the demographic characteristics of the students who participated in the study. About 60% of the students enter the AAU nursing program after graduating from a public or private high school. They are generally between the ages of 17-24 (62%), although nearly 26% are 30 years of age or older. The data show that the number of years in the nursing program does not necessarily correspond with the level of academic classification. About 12% are in the first year of the program, but about 24% of the students are at academic level one. Seventy-four (53.6%) of the students were Sensing-Thinking, 45 (32.6%) Sensing-Feeling, 15 (10.9%) Intuitive-Thinking, and 4 (2.9%) Intuitive-Feeling (see Table 3).

The Teachers' Demographic Characteristics

Table 4 presents a summary of the demographic characteristics of the nursing professors who participated in the study. Most (66.7%) are between 35-45 years of age. All have MSN degrees, and nearly half are working on Ph.D. degree. The number of years of experience range from first year faculty to those having 21 or more years of experience. About 78% of the faculty teach third- or fourth-level nursing students.

Table 2

Demographic Characteristics of the Nursing Students (n=138)

Variable	f	%
Age		
17-20	27	19.6
21-24	58	42.0
25-29	17	12.3
30-34	15	10.9
35-39	10	7.2
40 or more	11	7.9
Years in Nursing Program		
First Year	16	11.6
Less than 2 years	25	18.1
Less than 3 years	30	21.7
Less than 4 years	22	15.9
Four years or more	45	32.6
Academic Classification		
First Level	33	23.9
Second Level	22	15.9
Third Level	33	23.9
Fourth Level	50	36.2
School of Procedence		
Private High School	12	8.7
Private College	9	6.5
Private University	25	18.1
Public High School	72	52.2
Public College	3	2.2
Public University	17	12.3
Total	138	100

Table 3

Distribution of Student Learning Profiles

Variable	<i>f</i>	%
Sensing Thinking	74	53.6
Sensing Feeling	45	32.6
Intuitive Thinking	15	10.9
Intuitive Feeling	4	2.9
Total	138	100

Table 4

Demographic Characteristics of the Nursing Professors (n=9)

Variable	<i>f</i>	%
Age		
35-45	6	66.7
46 or more	3	33.3
Years of Experience		
1-10	4	44.4
11-20	3	33.3
21 or more	2	22.2
Academic Preparation		
MSN	5	55.6
MSN with Ph.D. courses	4	44.4
Teaching Level		
First Year	1	11.1
Second Year	1	11.1
Third Year	3	33.3
Fourth Year	4	44.4
Total	9	100

Preferred Teaching Styles

For this study, teaching style was defined as the different ways people prefer to use their perceptions and their judgment to transmit or receive data. Teaching style was measured by the Teaching Style Inventory (TSI) developed by Harvey F. Silver, Robert Hanson, and Richard W. Strong (1980). Table 4 shows the distribution of the nursing faculty's preferred teaching styles in the nursing program at AAU. All four teaching styles (Sensing-Thinking, Sensing-Feeling, Intuitive-Thinking, and Intuitive-Feeling) were found among the 9 nursing faculty. One preferred the Sensing-Thinking teaching style while one other preferred the Intuitive-Feeling style. The majority of teachers preferred the Sensing-Feeling (44.4%), and Intuitive-Thinking (33.3%) teaching styles.

Table 5

Nursing Faculty Preferred Teaching Styles (n=9)

Preferred Teaching Style	<i>F</i>	%
Sensing-Thinking	1	11.1
Sensing-Feeling	4	44.4
Intuitive-Thinking	3	33.3
Intuitive-Feeling	1	11.1
Total	9	100.0

Result of the Analyses

Results of data analysis are presented around the research questions and hypotheses as they relate to the problem of the study.

Question #1: What is the relationship between students learning profile and years in nursing program?

Null Hypothesis #1: There is no relationship between learning profile and years in nursing program.

Table 6 shows the nursing students' learning profiles in relation to the number of years they are in the nursing program. The results indicate that there was a predominant learning profile for each class of students. Most students at each class were Sensing-Thinking. Sensing-Thinking was the predominant learning profile for 1st-year students (62.5%). Similarly, 63.3% of 2nd-year students were Sensing-Thinking. Approximately 54% of 3rd-year students were Sensing-Thinking as well. About half (48%) of 2nd-year students were Sensing-Feeling. No 1st-year students had the Intuitive-Thinking learning style. There were also no Intuitive-Feeling among 3rd-year students.

The relationship between years in nursing program and learning profile was analyzed using Pearson Chi-square Goodness-of-fit test. It was hypothesized that there was a significant relationship between nursing student learning profile and years in nursing program. Because some cells were empty (e.g., no Intuitive-feelers among 3rd-year students), it was necessary to combine cells in order to meet the assumption for Chi-square. In this case, Intuitive-Thinking and Intuitive-Feeling were combined (see Table 6). The analysis yielded a Chi-square value of 5.68, which was not significant at the .05 level. Therefore it was concluded that for nursing students in this study, there was no statistically significant relationship between learning profiles and years in nursing program.

Table 6

Years in the Nursing Program and Learning Profile

Learning Profile		Years in Nursing Program				
		First Year	Second Year	Third Year	Fourth Year	Total
Sensing Thinking	Count	10	9	19	36	74
	% within learning profile.	13.5	12.2	25.7	48.6	
	% within years nursing program	62.5	36.0	63.3	53.7	
Sensing Feeling	Count	5	12	7	21	45
	% within learning profile	11.1	26.7	15.6	46.7	
	% within years nursing program	31.3	48.0	23.3	31.3	
Intuitive	Count	1	4	4	10	19
	% within learning profile	5.3	21.0	21.0	52.6	
	% within years nursing program	6.3	16.0	13.3	14.9	
Total		16	25	30	67	138

Note. $\chi^2 = 5.68$, $df = 6$, $p = .46$.

Question #2: What is the relationship between the nursing faculty's preferred teaching style and the nursing students' learning profile in the four year nursing program at AAU?

Null Hypothesis #2: There is no relationship between the nursing faculty's preferred teaching styles and the predominant learning profiles of each group of nursing students in the AAU nursing program.

Table 7 shows a cross-tabulation of the nursing students' learning profiles and the nursing faculty's preferred teaching styles. Only 21% to 27% of the students had matching learning profiles with the faculty teaching preferences. For example, only 21.6% of the students who had the Sensing-Thinking learning style matched with their faculty's teaching preferences. The match between Sensing-Feeling students and

Sensing-Feeling faculty was at only 26.7%. Similarly, only 26.7% of Intuitive-Thinking students matched with Intuitive-Thinking teaching preference.

Table 7

Learning Profile and Teaching Preferences

Learning Profile		Preferred Teaching Style				Total
		Sensing Thinking	Sensing Feeling	Intuitive Thinking	Intuitive Feeling	
Sensing Thinking	Count	16	22	28	8	74
	% within Learning Profile	21.6	29.7	31.8	10.8	
	% within Teaching Preferences	64.0	51.2	53.8	44.4	
Sensing Feeling	Count	8	12	20	5	45
	% within Learning Profile	17.8	26.7	44.4	11.1	
	% within Teaching Preferences	32.0	27.9	38.5	27.8	
Intuitive Thinking	Count	1	5	4	5	15
	% within Learning Profile	6.7	33.3	26.7	33.3	
	% within Teaching Preferences	4.0	11.6	7.7	27.8	
Intuitive Feeling	Count		4			4
	% within Learning Profile		100.0			
	% within Teaching Preferences		9.3			
Total		25	43	52	18	138

A Chi-square test of association was used to examine the relationship between student learning profile and faculty teaching preferences. To meet the assumption for the appropriate application of this test, Intuitive-thinking and Intuitive-feeling styles were combined for both students and faculty. The result of the analysis is found in Table 8. When the Intuitive-Thinking and Intuitive-Feeling profiles were combined into the Intuitive-Thinking/Feeling style, Intuitive-Thinking/Feeling teachers taught 47% of the students with this learning style. This was the strongest match between teaching styles and learning profiles. No significant deviation from the hypothesized results was found.

The analysis yielded a Chi-square value of 4.49, which was not significant at the .05 level. Thus, it was concluded that, for respondents in the study, there was no statistically significant relationship between the nursing faculty's preferred teaching styles and the nursing students' learning profiles in the 4-year nursing program at AAU.

Table 8

Teaching Preferences and Learning Profile

Teaching Preferences		Learning Profile			
		Sensing Thinking	Sensing Feeling	Intuitive Think/Feel	Total
Sensing Thinking	Count	16	8	1	25
	% within Teaching Preferences	64.0	32.0	4.0	100.0
	% within Learning Profile	21.6	17.8	5.3	18.1
	% of Total	11.6	5.8	0.7	18.1
Sensing Feeling	Count	22	12	9	43
	% within Teaching Preferences	51.2	27.9	20.9	100.0
	% within Learning Profile	29.7	26.7	47.4	31.2
	% of Total	15.9	8.7	6.5	31.2
Intuitive Thinking Feeling	Count	36	25	9	70
	% within Teaching Preferences	51.4	35.7	12.9	100.0
	% within Learning Profile	48.6	55.6	47.4	50.7
	% of Total	26.1	8.1	6.5	50.7
Total	Count	74	45	19	138
	% within Teaching Preferences	53.6	32.6	13.8	100.0
	% within Learning Profile	100.0	100.0	100.0	100.0
	% of Total	53.6	32.6	13.8	100.0

Note. $\chi^2 = 4.49$, $df\ 4$, $p = .34$.

Question #3: What is the relationship between the predominant learning profile of each group of nursing students, the nursing faculty preferred teaching style, and final course grades?

Null Hypothesis #3a: There is no relationship between the predominant learning profile of students and final course grade.

Null Hypothesis #3b: There is no relationship between the nursing faculty preferred teaching style and final course grades.

Null Hypothesis #3c: There is no interaction between learning profile of nursing students and faculty preferred teaching style.

Hypotheses 3a-3c were simultaneously tested using 2-way Analysis of Variance. Table 9 shows the means and standard deviation for the final course grade as it relates to the predominant learning profiles and preferred teaching styles. In general, students with three of the four learning profiles (Sensing-Thinking, Sensing-Feeling, and Intuitive-Thinking) had the mean final grades that ranged from 83.97% to 87.87%. However, final course grade of students with same three learning profiles (Sensing-Thinking, Sensing-Feeling, and Intuitive-Thinking), but were taught by the teacher who preferred the Intuitive-Feeling teaching styles, had averages above 90% (91.6% to 95.0%). When one looks at the course averages in the context of the four teaching preferences, it appears that students who were taught by teachers with Intuitive-Feeling teaching style scored about 10 percentage points higher than those taught by teachers with the other three teaching preferences. The result of the 2-way Analysis of Variance is found in Table 10.

Table 9

Mean and Standard Deviation for Final Course Grade

Learning Profile	Teaching Preferences	Mean	Standard Deviation	N
Sensing Thinking	Sensing Thinking	81.69	3.74	16
	Sensing Feeling	83.86	11.17	22
	Intuitive Thinking	82.21	9.24	28
	Intuitive Feeling	95.00	1.07	8
	TOTAL	83.97	9.28	74
Sensing Feeling	Sensing Thinking	82.88	6.79	8
	Sensing Feeling	84.33	10.97	12
	Intuitive Thinking	81.75	7.56	20
	Intuitive Feeling	91.60	5.32	5
	TOTAL	83.73	8.58	45
Intuitive Thinking	Sensing Thinking	92.00	-	1
	Sensing Feeling	85.00	3.67	5
	Intuitive Thinking	84.00	9.42	4
	Intuitive Feeling	93.00	4.64	5
	TOTAL	87.87	6.84	15
Intuitive Feeling	Sensing Feeling	71.75	10.40	4
	TOTAL	71.75	10.40	4
Total	Sensing Thinking	82.48	5.14	25
	Sensing Feeling	83.00	10.79	43
	Intuitive Thinking	82.17	8.48	52
	Intuitive Feeling	93.50	3.79	18
	TOTAL	83.96	9.10	138

Table 10

Analysis of Variance for Learning Profile and Teaching Preference

Source	Sum of Squares	df	Mean Square	F	Sig.
LEARNING PROFILE	623.823	3	207.941	2.982	.034
TEACHING PREFERENCE	1258.212	3	419.404	6.015	.001
LEARNING PROFILE TEACHING PREFERENCE	133.608	6	22.268	0.319	.926
Error	8715.984	125	69.728		
Total	11334.819	137			

The ANOVA results indicated no significant interaction between learning profile and preferred teaching style, $F_{(6, 125)} = .32, p = .926$, but significant main effects for learning profile, $F_{(3, 125)} = 2.98, p < .034$, and teaching style, $F_{(3, 125)} = 6.01, p < .001$. In general, the Sensing-Thinking, Sensing-Feeling and Intuitive-Feeling learning profiles obtained the highest final course grade with a mean of 92; the lowest course grade was obtained by the Intuitive-Feeling learning profile with a mean of 72.

Post-hoc multiple comparison using Tukey HSD procedure indicated that students with Sensing-Feeling ($M=83.73, SD=8.58$), Sensing-Thinking ($M=83.97, SD=9.28$), and Intuitive-Thinking ($M=87.87, SD=6.84$) learning profile obtained significantly higher final course grades than students with an Intuitive-Feeling ($M=71.75, SD=10.40$) learning profile. In addition, students taught by the teachers with Intuitive-Feeling teaching style ($M=93.5, SD=3.79$) scored significantly higher than students taught under the other teaching preferences.

Summary

In this chapter, analysis of the data was reported in relation to the demographics of the population, variables within the problem of the study, and the stated research questions. The population was described: students in relation to their ages, educational background, number of years in the nursing program, and academic classification; faculty were described by age, years of experience, academic preparation, and the academic level they taught.

Analysis for each research questions were presented as frequency distribution, means and standard deviations. The null hypotheses were tested using Chi-Square test

of association and Analysis of variance. The following are the major findings in this study.

1. Sensing-Thinking (53.6%) is the most predominant learning style among students.

2. Most teachers prefer the Sensing-Feeling (44.4%) and Intuitive-Thinking (33.3%) teaching style.

3. There is no significant relationship between learning style and year in the nursing program.

4. The match between student learning style and faculty teaching preference is at around 20%-25%.

5. Students with Sensing-Feeling, Sensing-Thinking, and Intuitive-Thinking learning styles have significantly higher final course grades than students with Intuitive-Feeling learning style.

6. Students taught by the teachers with Intuitive-Feeling teaching style scored significantly higher than students taught by teachers with other teaching preferences.

7. There was no interaction between student learning styles and faculty teaching preference.

CHAPTER V

DISCUSSION OF FINDINGS

This final chapter restates the research questions, and reviews the methodology used in the study. It summarizes the results and discusses their implications for practice. The chapter concludes with suggestions for future research.

Statement of the Problem

The need for registered nurses is increasing and the enrollment in BSN programs is declining. The U.S. Bureau of Labor Statistics has projected that employment for RN's will grow faster than the average for all occupations through 2008 and a federal advisory panel has recommended that to meet the more complex demands of today's health care environment, at least two-thirds of the basic nurse workforce should have baccalaureate degrees in nursing by 2010. In partial response to these concerns, the National League for Nursing (2000) has recommended self-assessment evaluations of nursing faculty preparation, curriculum updates, the use of teaching strategies that are mindful of the needs of students, and a look at their graduate success rate. The literature shows that the grades of first-year college or university students are of concern to the student and to administrators because grade point average is a factor in retention. Some research has also shown that learning profiles affect a student's achievement or success in school. The ease with which one learns depends on the congruency of a student's learning profile and

the teacher's teaching style; persons with certain profiles of learning do better in school than individuals with other styles. Consequently, this study is an attempt to describe the teaching styles of faculty and the learning styles of students in a 4-year BSN program at Antillean University in Puerto Rico and to investigate the relationship between the predominant learning profile of baccalaureate nursing students, the nursing faculty preferred teaching styles, and their final course grade in each class taken during the fall semester of the 2001-2002 school year.

Summary of Methodology

Quantitative research was used to explore the relationship among baccalaureate nursing students' learning profile, nursing faculty preferred teaching styles, and final course grades. The samples were students and faculty of the Department of Nursing at Antillean Adventist University, Puerto Rico. Most of the faculty (66.7%) are 35-45 years of age. All have MSN degree, and nearly half are working on a Ph.D. degree. The number of years of experience range from first year faculty to those having 21 or more years of experience. About 78% of the faculty teach both in their area of specialty and to third- or fourth-level nursing students.

The students were generally between the ages of 17-24, although 26% of them are 30 years of age or older. About 60% of the students enter the AAU nursing program after graduating from a public or private high school; the others enter the program with at least some public or private college/university experience.

Data were collected using two self-report instruments: (1) the Teaching Style Inventory (TSI), and (2) The Learning Profile Indicator (LPI) developed by Harvey F. Silver, J. Robert Hanson, and Richard W. Strong (1980) and J. Robert Hanson (1997). A data sheet was used to collect the participants' demographic information. The students' final course grade was the independent variable.

The questionnaires were administered to the 138 students through a personal visit to each nursing course, and to the 9 teachers at a nursing faculty meeting during the fall semester (August-December of 2001). Data were analyzed using the Statistical Package for Social Sciences (SPSS). Hypotheses were tested at the 0.05 level of significance. Pearson Chi-Square Goodness-of-fit test was used to determine the relationship between years in nursing program and learning profile and to examine the relationship between nursing faculty preferred teaching style and nursing students' learning profile. Frequency distribution and percentages were used to determine the nursing faculty's preferred teaching style. Lastly, two-way analysis of variance was used to test for significant relationship between the predominant learning profile of nursing students; the nursing faculty preferred teaching style, and final course grades.

Summary of Findings

1. Sensing-Thinking was the dominant learning style for 53.6% of the nursing students.
2. Most teachers prefer the Sensing-Feeling (44.4%) and Intuitive-Thinking (33.3%) teaching style.

3. There was no significant relationship between learning style and year in the nursing program.
4. The match between student learning style and faculty teaching preference is at around 20-25%.
5. Students with Sensing-Feeling, Sensing-Thinking, and Intuitive-Thinking learning styles have significantly higher final course grades than students with Intuitive-Feeling learning style.
6. Students taught by the teachers with Intuitive-Feeling teaching style scored significantly higher than students taught by teachers with other teaching preferences.
7. There was no interaction between student learning styles and faculty teaching preferences.

Discussion of Findings

The primary issue that prompted this study was the current and projected shortage of nurses and the declining enrollment for all nursing programs reported by the National League for Nursing (NLN) in 1996 (Heydman, 1991). This report refers to a nursing shortage and enrollment decline as well as to the increase in academically high-risk students in schools of nursing, and urges nursing educators to consider the problem of attrition in schools of nursing and the need for effective retention programs. To become a nurse requires a fairly intense term of study in one of three types of state-approved programs: a Diploma program, usually 3 years and hospital based; an Associate Program

which is a 2-year, usually community college-based course of study; and a Baccalaureate program (BSN) which is a 4-year university program.

The researcher's intent was to develop a greater understanding of the relationship between nursing students' predominant learning profiles and nursing faculty's preferred teaching styles as they related to students success. The literature review found one study (Pollick, 1993) that examined teaching styles and learning styles of nursing faculty and students but did not locate any research publication on the topic of students' learning profile and teaching style preferences in Puerto Rico for either a general population of students or for nursing students in particular. Hopefully, this understanding could be applied to the AAU nursing program and to nursing education in general to design effective teaching and learning strategies that facilitate the acquisition of knowledge and skills needed to develop nursing professionals, particularly in this time of nursing shortage. The results could also contribute to a framework for nursing teachers and administrators to use as the basis for curricular change, and improve understanding about how nursing students learn and how nursing faculty teach. It would also be important to know if nursing faculty should focus their instruction according to students' learning profiles.

A descriptive study of the demographic data was completed to identify characteristics of the nursing students and teachers. Analysis of the Demographic Data Sheet completed by the nursing students revealed that the majority (62%) of the students were 17 to 24 years of age, which is similar to findings reported by Linares (1989) for a comparable sample of nursing students. However, 38% of the students were over the age

of 25, 26% of the nursing students were 30 years of age or older which may be indicative of a current trend whereby more older nursing students are continuing their nursing career (National League for Nursing, 2002). Another finding revealed on the data sheet was that the greatest proportion (60%) of nursing students were in their third and fourth level of academic classification. This finding was consistent with the structure of nursing curricula in baccalaureate programs. Clinical nursing courses are included on the sophomore, junior, and senior levels with a predominance of nursing courses at the junior and the senior levels. General academic courses are programmed in the curricula to be taken with a predominance on the freshman and sophomore levels (National League for Nursing, 1998). The demographic data revealed that 67% of the nursing faculty were 35 to 45 years of age. This finding shows that the nursing faculty of AAU is classified as a young adult faculty, which is not consistent with the emerging trends in nursing faculty workforce. This may be good news for the AAU Department of Nursing. Aging faculty is one of the negative factors in the ability of nursing programs to educate a sufficient number of nurses to meet the future demands (National League for Nursing, 2002).

The wide range of years of experience (from 1 to 22 or more years) for the AAU nursing faculty is also similar with the one reported by Linares in 1999 in a study with selected health care professionals. This finding also supports the idea that teaching style can be influenced by the experiential background as mentioned by Conti in 1985. The experiential background allows the teacher to better understand the factors that influence their style and to identify areas of strength and areas for future development. The academic preparation of the nursing faculty at AAU is consistent with the National

League for Nursing academic requirements, which recommends that all faculty members who teach courses in a nursing program need to have at least a master degree in nursing (National League for Nursing, 1998). Mastery of the subject is a necessary characteristic for faculty who teach explanatory understanding which is part of the cognitive-field theory (Bigge, 1982; Riding & Rayner, 1998). At any level in the educational system observers seem to concur that too many teachers entering the classroom in recent decades have neither an adequate understanding of the subject matter they are supposed to teach nor an adequate understanding of how to teach it.

Stotsky, in 2001, commented that “research has regularly confirmed that the chief instructional variable correlated with higher student achievement is teacher knowledge of subject matter or verbal ability” (p. 60).

Students’ Predominant Learning Profile and Teachers’ Preferred Teaching Styles

The completion of the TSI and LPI research instruments results in the identification of teachers preferred teaching style and students predominant learning profile. Findings within the population of this study reflects that the match between students predominant learning profile and faculty teaching preferences is at around 20-25%. It is important to point out that everyone operates in all four styles but people tend to choose one particular style more than others.

For the population in this study teaching style preferences and predominant learning profiles have a low level of compatibility. In a study by Adams (2000) with school district staff, he reports particular learning style based on the grade level taught (p.

18). Pollick (1993), in a study with nursing students and teachers, revealed that there was no relationship between nursing student learning style and teachers preferred teaching style (p. 81). Neither the general educational programs nor nursing programs seek to pair the students learning profile with the preferred teaching styles. The important thing is that the more we know about our preferred teaching styles the more we can modify our approach depending on the circumstance at hand.

Turner says, “The strength of the school as a collective lies in the fact that over long periods of time students are exposed to many different teaching styles” (Turner, 1979, p. 257).

Turner’s position should inspire every educator to be skilled not in one but in several of the teaching styles. Also, this position can be used as another reason to continue the research related to teaching styles. The more teachers learn about their own teaching styles the more they can explain what happens in their classroom and why. The mismatch between teaching styles and students predominant learning profile do not represent a decrease in the process of knowledge acquisition. The argument against mismatch is that students need to be exposed and adapt to different learning situation in order to enhance their learning abilities. If matching styles leads to greater satisfaction and satisfaction to increased persistence, then the style match should be seriously considered.

The finding that students with Sensing-Thinking, Sensing-Feeling and Intuitive-Thinking learning profiles have significantly higher final course grades than students with Intuitive-Feeling learning profile is supported by the literature review. The

Resource Manual for Parents, Teachers and Students by Hanson and Hanson (1999)

contains a complete description of each of the learning profiles. They have also identified that of all students in a classroom, 35% can be identified as Sensing-Thinking and Sensing-Feeling (Hanson & Hanson, 1999). Hanson and Hanson (1999) associate the Sensing-Feeling learning profile to the helping professions, the Sensing-Thinking to careers that require learning a set of procedures which need to be done in an ordered way, and Intuitive-Thinking to academic curriculums that emphasize critical thinking skills. Nursing is a helping profession focused on critical thinking and the teaching of procedures that requires to be performed in an ordered way. It is imperative that nursing curriculums give priority to these aspects. As a result student final course grades will improve.

These findings also bring a clear picture of the students learning characteristics and which can assist faculty in the selection and use of a variety of teaching strategies directed to meet the students' needs. Students can benefit also, if they know during the school preadmission process which learning characteristics they have. This information can be useful because students can modify or adjust their learning style to the teacher/school requirements.

The finding revealing that students taught by teachers with Intuitive-Feeling teaching style score significantly higher than students taught by teachers with other teaching preferences could have various possible explanations. The learning behaviors and activities by teaching style as described by Silver et al. (1980) are presented in Table 1, chapter 2. Looking at how those behaviors are related to specific activities, the reader

can have a frame of reference of the differences between the teaching style and the implications that those differences have over the teaching/learning process. In this study the nursing students exposed to the Intuitive-Feeling teaching style obtained final course grades higher than 92%.

In contrast, when students were exposed to Sensing-Thinking, Sensing-Feeling and Intuitive-Thinking teaching styles they obtained final course grades below 88%. One possible reason can be supported by the teaching styles description found in the literature. The Intuitive-Feeling teachers as described by Hanson and Silver can be the ones that break down the traditional teaching methodologies, allowing students to work in a more comfortable setting facilitating the knowledge acquisition. Another possible reason could be that the Intuitive-Feeling teaching style tends to adopt in some ways a *laissez-faire* teaching style from which students can benefit based on the action-free characteristics that the teachers possess. In this study a comparison between Intuitive-Feeling professors and the other teaching styles was made for better understanding of these possible reasons. Table 11 shows a summary of the main distinctive characteristics found in the Intuitive-Feeling teacher as compared with the other teaching styles based on the TSI instrument components. To make a more in-depth validation of this finding, a larger nursing teacher population is necessary, to explore whether the course grade result is a common observation among the majority of the Intuitive-Feeling nursing teachers.

Table 11

TSI Components Versus Preferred Teaching Styles

TSI Components	Preferred Teaching Styles
Planning	<p>Intuitive-Feeling Plans frequently include specific and well define tasks.</p> <p>Others Feel most comfortable when their plans are based on key concepts and major themes.</p> <p>Intuitive-Feeling and Others More than a half of the participants including the intuitive refers that their plans frequently include important issues to be analyzed and addressed.</p>
Implementing	<p>Intuitive-Feeling and Others When they apply the plans to the classroom they work hard to connect they activities to the students life experience.</p>
Setting	<p>Intuitive-Feeling The preferred classroom atmosphere in which they feel more comfortable is with a variety of stimulus, creative activities and work projects.</p> <p>Prefers a physical setting to be friendly, comfortable place to work in, sit in circles, have conversations, and cooperative work.</p> <p>Others More than a half of participants refers that they feel more comfortable in a classroom atmosphere in which exits interaction, collaboration, and conversation facility. A third group 3 from 9 feel more comfortable in a classroom atmosphere that emphasizes intellectual challenge, serious inquiry and problem solving.</p> <p>Prefers a physical setting to be an intellectual stimulating room that promotes curiosity, debate, and discussion, with numerous books and resources for independent study.</p>
Curriculum Objectives	<p>Intuitive-Feeling and Others More than a half of the professors including the Intuitive answer that in general the major focus of the curriculum should be on developing creative potential in all academic areas.</p>
Operations	<p>Intuitive-Feeling Prefers tasks focus on small group discussions, personal sharing, role playing, simulations, group projects, team games and other cooperatives learning activities.</p> <p>Others The tasks they assign to their students tend to focus on workbooks, worksheets, recitation of information, practice exercise and programmed instruction. Also, feel more comfortable in a classroom atmosphere that emphasized intellectual challenge, serious inquiry and problem solving.</p>

Table 11--*Continued.*

TSI Components	Preferred Teaching Styles
Roles	Intuitive-Feeling and Others The work their students are required to do emphasizes self expression and synthesis of ideas; choice, craftsmanship and communication of ideas in new and original ways.
	Intuitive-Feeling and Others As a teacher tend to play the role of stimulator and facilitator. More than a half of the participants frequently use strategies circle talks, students working as partners; and group projects that emphasize helping ourselves and others. Enjoy when students play role of problem solvers and researchers. Qualities that most look for in the students include logical analysis, pleasure in thought, a strong sense of pattern.
	Evaluation Intuitive-Feeling In evaluating students' learning tend to rely heavily on projects and tasks requiring creative expression, imagination and the extension of learning to new contexts. In reviewing evaluation material emphasize on the amount of individual effort and student progress.
	Others More than a half in evaluating students' learning tend to rely heavily on short answer exercises that ask students to reproduce work they have practiced in classroom. More than a half in reviewing evaluation material emphasize on what is measurable, quantifiable and accurate.

Stotsky in 2001 presented an argument that can justify the reason for differences in teaching styles when she identifies as a barrier "to sound teaching" the fact that no systematic information is available on program, content and faculty qualification (p. 56). Each educational area needs to monitor their staff through internal and external evaluations in which the participants are informed about their qualifications as educators. This evaluation process helps teachers to receive feedback about changes or modifications needing to be implemented in their course content and methodologies to

reach all students. The result should be final course grade improvement in students within the four learning profiles.

Lastly, the finding that there was no interaction between students learning profiles and faculty teaching preferences indicate that the influence of student learning style on final course grade is not dependent upon the effect of faculty teaching preferences. Similarly, the influence of teaching preferences on final course grade did not depend on the effect of student learning style. A similar result was found by Pollick (1993). Only one study was found in the literature investigating the relationship between learning profile, teaching style and final course grade in the field of nursing. The study was not done in Puerto Rico.

Although there are no significant interactions between the study variables, the investigation reflects that there are significant main effects. Those main effects reveal that learning profile has some relationship to final course grade and that teaching style also has some relationship with the same dependent variable. Those effects state the basis to consider that final course grade can be improved if nursing students knows at the very beginning of their studies their own learning profiles and faculty recognize their teaching preferences. Combining efforts between nursing program administrators and the institution to provide seminars and evaluations process to the faculty can help students become more academically successful.

Conclusions

1. There is a mismatch between teaching styles and students' learning profile at

the nursing program at Antillean Adventist University.

2. This study did not provide enough data to validate why students taught by Intuitive-Feeling teaching style scored significantly higher final course grades.

Implications for Practice

1. The theory of learning styles, since it is empirically sound and theoretically useful, could be adopted as a frame work in nursing curriculum development.

2. Faculty in staff development and university educational settings, could uses matching and mismatching in instructional methodologies based on students learning styles.

3. Nursing programs can utilized learning profile indicators as a tool which can help to identified those learning characteristics that prevail in their learners population and therefore reduce students attrition rate.

4. In an effort to decrease student attrition rate, preadmission counseling must focus on discussing with the students the nature of nursing as a helping profession requiring critical thinking and the development of skills on specific procedures.

5. The nursing faculty awareness of their preferred teaching style is important for self-understanding and better planning of their instructional methodologies.

Suggestions for Research

As a result of the findings and the conclusions, the following suggestions for further research are submitted:

1. To replicate this study using a larger sample to investigate differences within

and between other specific disciplines and taking in consideration private and public academic institutions.

2. To conduct a study in Puerto Rico with a larger sample to explore the Intuitive-Feeling teaching preference among nursing faculty.
3. To conduct a longitudinal qualitative case study describing the learning experience of a number of baccalaureate students through their 4-year nursing program.

APPENDIX A

ENGLISH VERSION OF THE LEARNING PROFILE INDICATOR

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**Appendix A
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APPENDIX B

ENGLISH VERSION OF THE TEACHING STYLE INVENTORY

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APPENDIX C
PERMISSION LETTERS



J. ROBERT HANSON, SONS & ASSOCIATES

The Whole Child Press

[106]

May 31, 01

Ms. Lourdes Mendez
P O Box 188
Mayaguez, Puerto Rico

Dear Ms. Mendez,

Enclosed are five copies of the TSI. The instrument is not available in Spanish. You may, for the purposes of your own specific research, translate the instrument for this one-time purpose, only. Any other uses are prohibited by copyright law.

Research in teaching styles requires the prior completion of the Learning Profile Indicator. Find gratis copy enclosed.

Research in teaching style(s) must be related to the subject's learning profile; said profile coming as a result of completing the LPI.

The focus of the research, then, is to relate the subject's learning profile to his or her teaching profile. A competent teacher, by definition, must be able to vary his or her delivery to "match" both the demand of the content, and the various learning dominances of the students. For example, if the teacher's profile was ISTA, and the students were dominantly ESFR's then little learning will take place and there will be considerable frustration on everyone's part. Or, again, if the content requires analysis and evaluation, and the teacher presents this material in an NF fashion, then the students will be confused and the teacher will wonder why they're not getting the content.

In a normal classroom in required subjects there will normally be a distribution of learning styles as follows: 35% ST; 35%SF, 20% NT and 10%NF. Again, in a normal distribution some 70% will be more extraverted than introverted, and 60% will be more Active than Reflective.

Research requires the application of multivariate analysis since there are, at a minimum, three variables: 1) the teacher's profile; the students' profiles, and 3) the categorization of the objectives or content to be learned. Ideally, the competent teacher is one who can match instruction to both the students' dominant functions, and the requirements of the content. In

CLASSROOM APPLICATIONS OF ANALYTICAL PSYCHOLOGY

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SENIOR ASSOCIATE,
MENTAL HEALTH &
COUNSELING

JEAN SEELY, B.A.
RESEARCH ASSISTANT

CONSULTATION AND
TRAINING IN...

AUTHENTIC
ASSESSMENT

EDUCATIONAL
PLANNING

INTEGRATED
CURRICULUM

LEARNING STYLES
AND PROFILES

MORAL AND EMOTIONAL
INTELLIGENCES

ORGANIZATIONAL RENEWAL

TEACHING
STRATEGIES

THINKING SKILLS

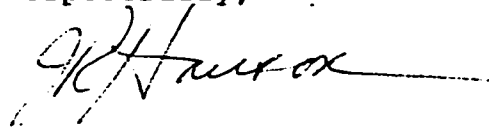
TEAM
BUILDING



practice this means that the teacher must have a repertoire of teaching strategies so that instruction can rotate around the style dominances.

I've also enclosed, at no cost, a copy of a research design that provides for the analysis of student academic success based on the teacher's ability to alter delivery systems.

Respectfully,



Enclosures

5 TSI's

1 LPI

1

**ANDREWS UNIVERSITY
SCHOOL OF EDUCATION
CURRICULUM AND INSTRUCTION PROGRAM**

July 17, 2001

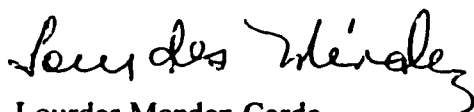
Dear Mrs. Maria L. Cruz
Nursing Program Dean
Antillean Adventist University
Mayaguez, P.R. 00681

I am a student in the curriculum and instruction doctoral program at Andrews University, Michigan, carrying out a study on teaching and learning. In this study, I am investigating the relationship between nursing students learning styles predominance and nursing faculty teaching style preferences in the nursing program of the Antillean Adventist University. I would like your permission to administer the enclosed "Learning Profile Indicator" to each group of nursing student in first, second, third, and fourth year of your nursing program. I would also like to administer the enclosed "Teaching Style Inventory" to the current teachers of the above students.

Enclosed you will find copies of the two instruments and a consent to participate form.

I will be contacting you within the next week and I thank you in advance for your assistance. I will be happy to share the results of this study with you if you wish.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lourdes Mendez".

Lourdes Mendez-Cardé
Doctoral Candidate



July 17, 2001

Lourdes Méndez
Doctoral Program Student

Dear Mrs. Méndez:

Our faculty discussed your request to do your research study in our nursing program. We have take the decission to grant you the permission to administer the "Learning Profile Indicator" to each group of students in the first, second, third and fourth years of our nursing program. You can also administer the "Teaching Style Inventory" to our teachers who work with the above students.

I hope that this investigation will improve the nursing faculty teaching style preference in relation with the nursing students' learning styles predominance.

Sincerely yours,

Maria L. Cruz, MSN, RN
Nursing Department Director

vcm

August 22, 2001

Lourdes Mendez
PO Box 3131
Hato Arriba Station
San Sebastian
Puerto Rico 00685

Dear Lourdes

Your Application for Approval of Research Involving Human Subjects/Exempt from Full HSRB Review has been approved subject to the following conditions:

- 1] You need to provide us with a letter of approval from institution where the research will be conducted; and,
- 2] During the process you need to get the voluntary consent of all subjects that you interview.

We hope that your research goes well.

A handwritten signature in black ink, appearing to read 'Michael D Pearson', with a large, stylized loop at the top.

Michael D Pearson
Office of Scholarly Research

Copy: Dr. Judith Anderson

July 17, 2001

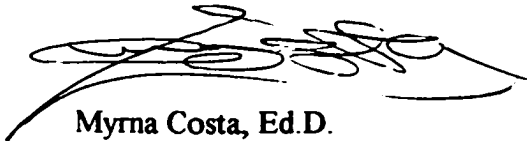
**Human Subject Review Board
Andrews University
Berrien Springs Michigan**

To Whom It May Concern:

I hereby certify that professor Lourdes Mendez has authorization to conduct her dissertation research at our University utilizing the necessary human subjects for successful gathering of the data.

If you need further information, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read 'Myrna Costa', with a long, sweeping horizontal line extending from the end of the signature.

**Myrna Costa, Ed.D.
Vice President for Academic Affairs
and Enrollment Management**

ep

APPENDIX D

TRANSLATED SPANISH VERSION OF THE LEARNING PROFILE INDICATOR AND TEACHING STYLE INVENTORY

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APPENDIX E

DEMOGRAPHIC DATA SHEET FOR NURSING FACULTY

**HOJA DE DATA DEMOGRAFICA PARA LA
FACULTAD DE ENFERMERIA**

Instrucciones:

Favor de responder a las siguientes preguntas circulando el número apropiado.

Esta hoja proveerá información general sobre usted y su procedencia académica (para ser usada en una investigación doctoral). Sus respuestas serán voluntarias y mantenidas en estricta confidencialidad.

EDAD

- | | | |
|--------------|--------------|---------------|
| 1. (25 – 34) | 2. (35 – 45) | 3. (40 o mas) |
|--------------|--------------|---------------|

AÑOS DE EXPERIENCIA

- | | | |
|-------------|--------------|---------------|
| 1. (1 – 10) | 2. (11 – 20) | 3. (21 o mas) |
|-------------|--------------|---------------|

PREPARACION ACADEMICA

- | | |
|--------------------------|----------------------------|
| 1. BSN con cursos de MSN | 3. MSN con cursos de Ph.D. |
| 2. MSN | 4. Ph.D. |

NIVEL ACADEMICO CURSOS QUE ENSEÑA

- | | |
|------------------|-----------------|
| 1. Primer Nivel | 3. Tercer Nivel |
| 2. Segundo Nivel | 4. Cuarto Nivel |

APPENDIX F

DEMOGRAPHIC DATA SHEET FOR NURSING STUDENTS

HOJA DE DATA DEMOGRAFICA PARA ESTUDIANTES DE ENFERMERIA

Instrucciones:

Favor de responder a las siguientes preguntas circulando el número apropiado.

Esta hoja proveerá información general sobre usted y su procedencia académica (para ser usada en una investigación doctoral). Sus respuestas serán voluntarias y mantenidas en estricta confidencialidad.

EDAD

- | | |
|--------------|----------------|
| 1. (17 – 20) | 4. (30 – 34) |
| 2. (21 – 24) | 5. (35 – 39) |
| 3. (25 – 29) | 6. (mas de 40) |

NUMERO DE ANOS EN EL PROGRAMA DE ENFERMERIA

- | | |
|--------------------|----------------------|
| 1. Menos de 1 año | 4. Menos de 4 años |
| 2. Menos de 2 años | 5. Cuatro años o más |
| 3. Menos de 3 años | |

CLASIFICACION ACADEMICA

- | | |
|------------------|-----------------|
| 1. Primer Nivel | 4. Cuarto Nivel |
| 2. Segundo Nivel | 5. Otro _____ |
| 3. Tercer Nivel | |

PROCEDENCIA ACADEMICA

- | | |
|-----------------------------|----------------------------------|
| 1. Escuela Superior Privada | 3. Colegio o Universidad Privada |
| 2. Escuela Superior Publica | 4. Colegio o Universidad Publica |

APPENDIX G
CONSENT FORM

**HOJA DE CONSENTIMIENTO DE LA FACULTAD PARA
PARTICIPAR EN EL ESTUDIO**

Yo, _____ acepto voluntariamente participar en el estudio sobre Aprendizaje Predominante y Estilos de Enseñanza. Mi participación consistirá en responder los incisos del Análisis de Estilos de Enseñanza. Además le proveeré al investigador una copia de la nota final de los estudiantes al terminar el curso.

Yo entiendo que mi participación en este estudio no me coloca en ningún riesgo físico o mental. Mi participación en este estudio será estrictamente confidencial. También entiendo que no tendré que colocar mi nombre en el Análisis de Estilos de Enseñanza ni en la hoja de Data Demográfica.

Firma _____

Fecha _____

**HOJA DE CONSENTIMIENTO DE LOS ESTUDIANTES PARA
PARTICIPAR EN EL ESTUDIO**

Yo, _____ acepto voluntariamente participar en el estudio sobre Aprendizaje Predominante y Estilos de Enseñanza. Mi participación consistirá en responder los incisos del Indicador del Perfil de Aprendizaje. Además permitire que se le provea al investigador copia de la nota final al terminar el curso.

Yo entiendo que mi participación en este estudio no me coloca en ningún riesgo físico o mental. Mi participación en este estudio será estrictamente confidencial. También entiendo que no tendré que colocar mi nombre en el Indicador del Perfil del Aprendizaje ni en la hoja de Data Demográfica.

Firma _____

Fecha _____

REFERENCE LIST

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REFERENCE LIST

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